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EDITED BY

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ORIGINAL ARTICLES.

MONTANA AS A SWISS HEALTH STATION FOR ENGLISH TUBERCULOUS PATIENTS.

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Switzerland has won world-wide distinction for its health and holiday resorts. Nature has richly endowed this mid-European country and made it a veritable wonderland to which come in ever-increasing numbers from all parts of the world those who are in need of mental and physical restoration, or seek renewal of physical powers in the prevention and arrest of disease. And the Swiss people have wisely welcomed and provided for the needs of all comers. This little nation, although made up of those who are divided by language, religion, racial characteristics, and separated by physical barriers, has been welded into a patriotic, harmonious pacific republic, the citizens of which are marked by an enthusiasm for education, intense industry, frugality, and enterprise, and possess a genius for wise, kindly, courteous hospitality. And so it has come about that Switzerland and its people have provided not only a playground for the sound and vigorous, but also a sanatorium for the delicate and sick. The high mountain health stations of this fascinating country have proved of

conspicuous advantage in the treatment of a number of morbid conditions, but first and foremost they are recognized as invaluable centres for the restoration of the tuberculous.

General Considerations.

Montana, among the various places which have become distinguished as desirable resorts for the treatment of tuberculosis, occupies a fore-

MONTANA: GENERAL VIEW, WITH RHONE VALLEY AND PEAKS OF THE PENNINE ALPS.
The English Sanatorium is the large white building shown on the left in the foreground.

most place, and it is the purpose of this paper to indicate in as concise and complete a manner as possible the principal reasons for considering Montana the most desirable mountain station for English patients suffering from tuberculosis in its various forms, and particularly tuberculous disease involving the respiratory organs.

At the very outset of our paper we would direct attention to a point of considerable importance as judged from a medical standpoint. Montana is readily accessible to English visitors, and can be reached in about twenty-two hours from London with a minimum of the discomforts of travel. A through carriage can be obtained from Calais in the Orient express or one of the other through trains via Vallorbes, Lausanne, Montreux, and the Rhone Valley to Sierre, and thence by a wonderful funicular railway Montana is reached. Sleeping accommodation on the fast trains can always be obtained if sufficient notice is given.

The social, as well as the climatic, atmosphere of Montana will be appreciated by English patients. French is generally spoken by the Swiss, but most of the shopkeepers and attendants speak some amount of English, and always extend a warm welcome to all English visitors.

The ease with which Montana can be reached, and the comparative inexpensiveness of the journey, enable relatives and friends of the patients to visit them during summer holidays and enjoy the beauty of this most perfect of summer resorts. Moreover, in mid-winter the journey out entails but little loss of time and enables visitors to participate in the delights of winter sports.

Montana is so situated that it can be easily reached from all parts of Europe. Its position, close to one of the great European railway routes, not only provides for ready access, but enables patients who require occasional change of scene, or transfer to a lower altitude, to visit the favourite stations on the Lake of Geneva, or those in the ever-charming lake district of North Italy, with but little fatigue and small outlay.

Geographical and Climatological Data.

Montana is situated in the Upper Valais, on the slopes overlooking the Rhone Valley, at an altitude of 5,000 feet. The position is unique—an extensive plateau of undulating meadows, a veritable garden for every variety of wild Alpine flowers; lakes; forests; and sheltering mountains. An unrivalled panorama lies open for some ninety miles towards the south, extending from Brigue in the east to Martigny in the west, with the snow-clad mountains of Valais reaching from the Simplon to Mount Blanc, and including some of the most famous of the Alpine peaks, such as the Weisshorn, the Zinal Rothorn, the Gabelhorn, the Grand Combin. At the back of Montana lies the massif of the Wildstrubel and adjacent mountains, affording protection from the cold north winds. Its position open to the south, with no near mountains to obstruct the outlook, provides for a maximum of exposure to sunlight. Indeed, the extensive allowance of sunshine must be considered one of Montana's most valuable assets. It enjoys a larger amount of sunshine than any other health station in Switzerland. The

annual amount of sunshine registered at the principal Swiss health resorts is as follows:[1] Montana, 2,181 hours; Leysin, 1,768; Arosa, 1,724; Davos, 1,669. A comparison of the returns of the average daily sunshine in hours during the six months of winter at Montana with certain British places is of interest:[1] Montana, 5·28 hours; Margate, 2·56; Birmingham, 1·71; Glasgow, 1·44; Westminster, 1·35. In these days when heliotherapy occupies such a prominent place in the treatment of tuberculosis the abundant sunlight available at Montana is a feature of the greatest importance.

Another special consideration which makes Montana so suitable for consumptives and other tuberculous subjects is the freedom from wind during the winter. This allows of the maintenance of an all-the-year-round open-air life, whereas in nearly all parts of Britain patients cannot without great hardship be kept in the open air all day. During the summer Montana, although enjoying a maximum amount of sunshine, is never oppressively hot, as the heat is tempered by cooling and refreshing mountain breezes.

Montana enjoys other climatic advantages which are of the greatest value for a health station. The air is dry, the rainfall is comparatively low, and the subsoil is so light that moisture is rapidly absorbed, and this, together with rapid evaporation, keeps the ground dry and suitable for walking. Moreover, snow melts rapidly, and not infrequently the grassy slopes continue green until nearly Christmas. The snow of mid-winter quickly passes as March advances, and thus residents are relieved from the slush and unpleasantness which accompanies the coming of spring in many districts.

The climate of Montana generally is milder than that of the other Swiss resorts frequented by tuberculous patients. Fogs are almost unknown; the air is crisp, rarefied, dry, and stimulating; and the patient is enabled to avail himself of all the healing influences associated with a high mountain climate, and is free from practically all of the drawbacks of residence at an Alpine Health Resort.

It is only about twenty years ago that Montana was "discovered" as a desirable health station for consumptives and other tuberculous subjects, and the place is still in course of development, and will speedily become the most popular of Swiss centres for English patients. Already there are almost all features available which an English visitor can desire. There are a number of hotels, pensions, and châlets. There are Anglican and Roman Catholic churches and an Anglo-Swiss school. A particularly fine nine-hole golf course exists. The lakes provide opportunities for fishing and boating. The walks are

[1] These returns are taken from "Sunshine and Open Air: Their Influence on Health, with Special Reference to the Alpine Climate," by Leonard Hill, M.B., F.R.S. London: Edward Arnold and Co. 1924.

numerous. Level paths and graduated roads enable patients to participate in suitable walking exercise. An active Société de Développement de Montana is accomplishing notable service. Preparations are being made for the formation of central public gardens and other features

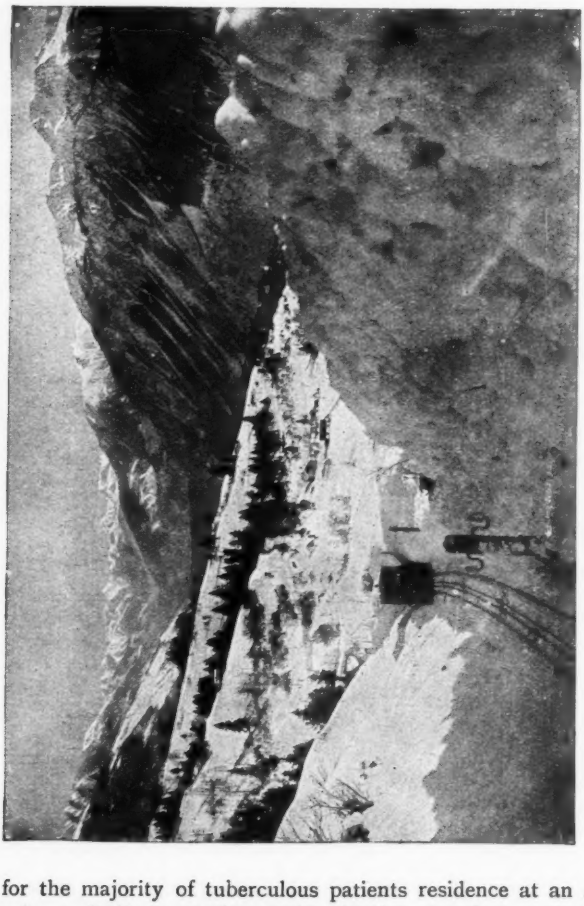
MONTANA: THE FUNICULAR RAILWAY FROM SIERRE TO MONTANA.

which will add to the comfort and pleasure of patients and their friends.

Psycho-Physiological Factors.

In the selection of patients for treatment at such an Alpine mountain station as Montana there are several points of fundamental

importance which deserve fullest consideration. First and foremost the psychology of the tuberculous patient should be studied. There are certain individuals who can never be really happy out of England or away from relatives and friends, and to send these to foreign health stations against their will or without their full co-operation is a mistake.



MONTANA: THE FUNICULAR RAILWAY FROM SIERRE TO MONTANA IN WINTER.

But for the majority of tuberculous patients residence at an Alpine station in a suitable sanatorium and under the care of sympathetic and experienced doctors and nurses, and in association with congenial fellow-patients, exercises a most beneficial effect on the mental life of the individual. Plentiful warm sunshine, freedom from damp, cold winds and irritating fogs, exposure to bright invigorating atmospheric

conditions, and association with hopeful, helpful companions, act as psychological stimuli of the greatest value. All these serviceable factors are available at Montana. Even bed cases are content to look out on the ever-changing moving pictures which face them in the snow-clad mountain peaks, forest-covered slopes, and peaceful meadowlands. The Montana panorama, unlike the scenes met with in places where mountains are near at hand, and which oftentimes seem to oppress the patient, instead of depressing, attract and expand, stimulate and elevate.

This is not the place to enter upon any elaborate discussion of the nature and effects of meteorological, climatological, and bio-physical influences on the human subject under treatment according to sanatorium methods, and particularly modern forms of heliotherapy and actinotherapy. Our knowledge is still very limited, and much of our action has to be more or less empiric, although based to a considerable extent on actual experience and the results of scientifically-designed experiments. Many points are still under discussion, and opinions differ widely. There are numerous excellent manuals now available where the biochemical and biophysical problems of climatology, aerotherapy, heliotherapy, actinotherapy, and the like are fully considered.[1]

Brief reference may be made to certain points of practical importance to patients undergoing treatment at an Alpine sanatorium, for residence at a high altitude undoubtedly brings about certain physiological modifications and adjustments which exercise an influence on functional conditions, and may probably produce a profound change in regard to organic processes both normal and morbid.

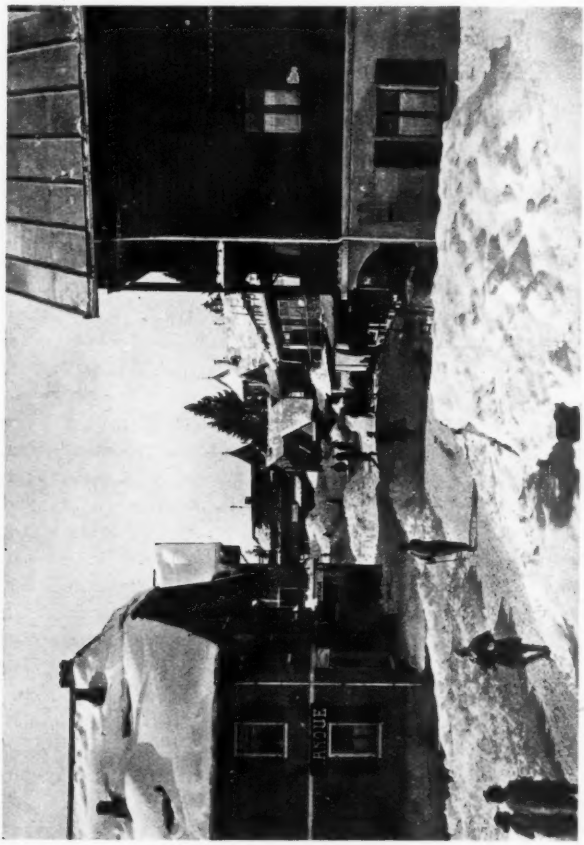
At mountain stations the barometric pressure is comparatively low, and this leads directly and indirectly to readjustment in respiration, blood changes, and metabolic modification. The temperature of the air at high altitudes is very definitely lower than that at sea-level. The difference is estimated as approximately 1° F. for every 300 feet of altitude. On the Alps the atmosphere is dry, pure, rarefied, and the sunlight is rich in heat, light, and ultra-violet rays. In the plains the atmosphere is rich in water vapour, often loaded with smoke and other impurities, and much of the sun's rays are absorbed.

At Alpine stations the dryness, tenuity, purity, and stillness of the

[1] See volumes prepared by Professor Leonard Hill, M.B, F.R.S., for the Medical Research Council: "The Science of Ventilation and Open-air Treatment." Part I., pp. 249, 1919. Part II., pp. 295, 1920. Published by H.M. Stationery Office. Consult also "Sunshine and Open-air," by Dr. Leonard Hill. London: Edward Arnold and Co. 1924.

Reference should be made to "Ultra-Violet Rays in the Treatment of Disease," by Dr. Percy Hall. Second edition. London: William Heinemann (Medical Books), Ltd., 1925; and "Artificial Sunlight and its Therapeutic Uses," by Dr. F. H. Humphries. Second edition. London: Humphrey Milford, Oxford University Press. 1925.

air lessens the tendency to develop catarrhal states, and there is but little chance of infection. The lowered barometric pressure leads to deeper and more frequent respirations and increased cardiac action. Associated with these changes is an increase of red corpuscles and hæmoglobin, metabolic activity is raised, and nervous energy is



MONTANA: THE VILLAGE MAIN STREET IN WINTER.

augmented. Reparative processes are accelerated. There is reason to believe that in many cases the bactericidal action of the blood and the protective mechanism of the tissues are rendered more powerful and effective. The basal metabolism in patients able to respond to the tonic and stimulating action of an Alpine station is markedly increased. Professor Leonard Hill, from investigations carried out at Montana,

finds that this amounts to from 40 to 100 per cent. in patients living under open-air conditions.

Much might be said in regard to the therapeutic action of light, and especially the ultra-violet rays of the sun. One of the most conspicuous results of the sun-bath is pigmentation of the skin. The exact nature of this reaction is still under discussion, some holding it to be a protective measure. In any case, it is generally viewed as indicative of a beneficial influence. Cases which do not pigment usually appear to gain only limited advantage from heliotherapeutic measures. The sun's rays produce both local and general reactions in the majority of tuberculous cases, and whatever may be the effect on a visible or deep-seated local tuberculous lesion it is essential that the general response of the body should be carefully watched. The opinion now generally held is that the good results which accrue from heliotherapy in all its forms is due mainly, if not entirely, to some general reactions, the precise nature of which still remains obscure, but due, doubtless, to complex bio-chemical and bio-physical processes exercising profound influence on infective and other pathological conditions. Sunbaths can be enjoyed at Montana during both summer and winter. As is generally recognized, the possibility of carrying on serviceable heliotherapy in Great Britain is very limited. Lack of adequate sunlight during the winter and oftentimes for many days at a time even in summer, together with the prevalence of a damp, cold atmosphere and winds and want of adequate arrangements for the exposure of a patient in a protected and private and yet sun-exposed position, make heliotherapy a medical measure which, of necessity, has a very restricted application. At Montana during a winter's day five hours of sunshine is commonly available. The ultra-violet rays of the sun are more intense than any such rays which can be employed at home. Reflection from clear sky and brilliant snow adds greatly to the total light effects. The abundant radiant energy from sun, sky, and snowfields produces a sense of exhilaration, and maintains a spirit of hopefulness and expectancy which exercises a beneficent influence.

Clinical Considerations.

Montana provides all essential climatological conditions, therapeutic equipment, and medical supervision for the scientific conduct of all-the-year-round treatment of tuberculous cases in accordance with the best and most modern principles of treatment. Undoubtedly, in the majority of cases, a tuberculous patient gains his best chance of cure by a continuous, systematized application of the combination of therapeutic measures, included in the designation sanatorium treatment, the essential elements of which are thorough medical supervision,

skilful nursing, abundant and properly selected dietary, and regulated rest and graduated exercise—all these to be carried out under what must be practically open-air conditions and in the most favourable of climates. Recent clinical experience and scientific experiments have amply demonstrated that heliotherapy or sunlight treatment when applied under expert direction affords one of the most valuable of agencies known to medical science in the prevention, arrest, and amelioration of tuberculosis and the cure of various morbid conditions associated with or consequent on tuberculous infection.

In cases of so-called surgical tuberculosis, including tuberculosis involving glands, bones, and joints, heliotherapy works wonders. It is often of great service in abdominal tuberculosis. In tuberculosis occurring in childhood and youth sun treatment is of immense value. But in dealing with intrathoracic tuberculosis, where pleuræ, lungs, hilar glands, and mediastinal structures are involved, heliotherapy has to be used with caution, precision, and only under a system of medical control and adequate nursing assistance. An uncontrolled self-administration of sun-baths by consumptive patients will prove of little or no service, exposes the patient to grave risks, and may prove disastrous by waking up slumbering foci, quickening progressive disease, producing hæmorrhage, and lowering the general resistance and healing powers of the individual.

No doubt open-air and sun treatment can be carried out with considerable benefit in England, especially in favourable seasons, but during winter months climatic conditions and the paucity or absence of ultra-violet rays from such little sunshine as is able to penetrate the mists and fogs, makes effective heliotherapy almost impossible in the greater part of the British Isles.

At a Swiss Alpine health station, such as Montana, the case is very different. Here throughout the whole year a tuberculous patient can carry on treatment, making use of all Nature's healing powers and supplementing them by medicinal or other agents as may be considered desirable by the medical adviser. Many doctors and patients appear to be under the impression that patients, while wise in undergoing treatment at a Swiss resort during the winter, may with advantage return to their homes and more or less ordinary life in England for the late spring and summer. We have no hesitation in saying that such a view is oftentimes a serious mistake. An interruption in the systematic course of treatment generally hinders and prolongs the period of recovery and not infrequently leads to a renewal of activity in a healing or arrested lesion. Probably the majority of patients with really serious tuberculous involvement of lungs would reap the greatest advantage by a practically continuous residence at Montana throughout both winter and summer, with perhaps an occasional short change

to the Italian Lakes in the spring and a short residence on the shores of the Lake of Geneva in the autumn.

Brief reference may be made to the class of tuberculous case which gains the greatest advantage from a course of treatment at Montana. Naturally, patients in whom the lesion is limited, non-progressive, and

MONTANA: GOLF LINKS AND ONE OF THE LAKES, WITH VIEW OF THE WEISSHORN AND OTHER VALAIS MOUNTAINS.

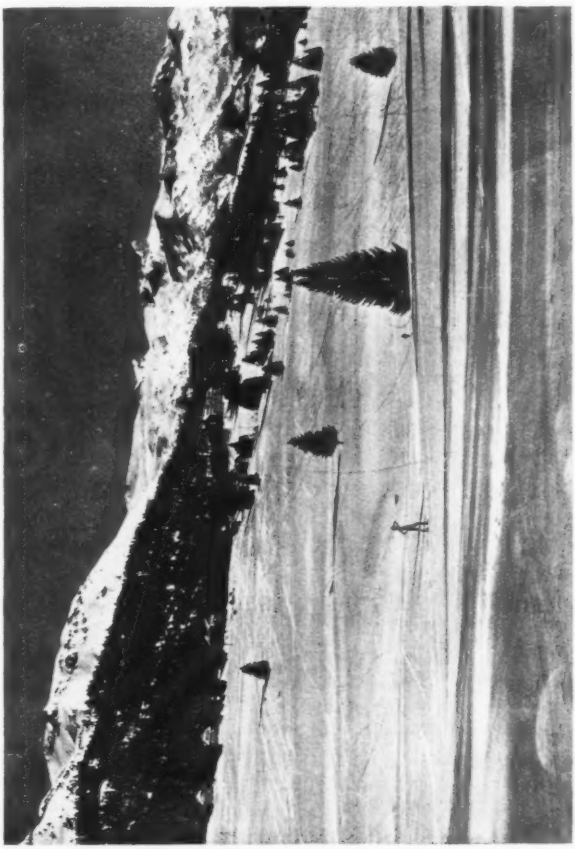
the reparative powers are good do well. If the best results are to be obtained and in the quickest time, all cases of suspected and early intra-thoracic tuberculosis should, wherever possible, be given the advantages of Alpine treatment. With the newer methods of diagnosis now available, and particularly the assistance which can be rendered by the expert radiologist, many cases of pulmonary tuberculosis can be

detected and brought under effective treatment in their early stages. The development of pleurisy, the occurrence of hæmoptysis, progressive loss of weight, and increasing debility in carrying on daily duties, should arouse suspicion that tuberculous trouble is already in progress and calling for prompt action. In the majority of tuberculous cases seeking medical advice the disease has already made considerable headway before the doctor is consulted. In many such cases further valuable time is lost through the hesitation of friends, the unbelief of the patient, or the desire of the doctor to attempt some form of treatment under the limitations of home and urban conditions, and oftentimes with a continuance more or less of professional or business duties. There are comparatively few patients who are not benefited by a wisely directed sanatorium treatment in such an Alpine centre as Montana. The contra-indications are much less numerous than was formerly believed. There should be hesitation in sending the very young or the very old. Children and adolescents of all ages usually do exceedingly well. Chronic, progressive, debilitated subjects in whom the disease is extensive and has wrought much damage, and who, therefore, are bankrupt in their powers necessary for restoration, should receive such palliative and ameliorative treatment as is possible in their own land, and generally this means in their own homes. Elderly subjects, especially men with evidences of cardio-vascular degeneration with thickened arteries and high blood pressure, who are the subjects of long-standing pulmonary fibrosis, are unsuitable for a high altitude. Cases showing evidences of hyperthyroidism, valvular disease of the heart, chronic renal disease, mental instability and nervous affections, commonly prove unsatisfactory subjects for all mountain resorts. Patients with advanced laryngeal, intestinal, or other active tuberculous involvement, and all enfeebled, debilitated, and manifestly hopeless cases, should be excluded.

A history of hæmorrhage is not to be taken as a contra-indication. Many cases of hæmoptoic onset do uncommonly well. Many patients with slight laryngeal involvement, if properly supervised, progress favourably. Cases who have been the subjects of an artificial pneumothorax often do admirably at a mountain sanatorium. For the carrying out of systematic treatment by the production of artificial pneumothorax Montana is specially equipped. Most cases of simple surgical tuberculosis—that is, tuberculous disease involving bones, joints, glands, serous membranes—react to properly applied heliotherapy. Although in cases of unilateral renal tuberculosis early surgical interference is generally advisable, heliotherapy plays an important part in after-treatment: in bilateral cases the application of heliotherapy has often been followed by considerable improvement, and in some instances by complete arrest of the trouble. Cases of lupus and various tuber-

culides are oftentimes much advantaged by sun treatment, but in the majority of these cases artificial light treatment, or actinotherapy, is now proving remarkably successful.

Sanatorium treatment at such a centre as Montana is also of great benefit to a number of non-tuberculous subjects. Among these, special reference should be made to patients convalescing from accidents,



MONTANA: THE PLATEAU IN WINTER.

septic processes, influenza, and other infectious diseases; also those run down, anæmic, and debilitated from physical and mental overwork, or who are constitutionally or through acquired conditions in an unstable, sub-standard condition, which can justly be viewed as a pre-tuberculous state.

It should be noted that many cases of asthma gain great relief from

residence at Montana. Some cases of bronchiectasis also appear to be benefited. A large number of subjects, troubled by various types of nasal and bronchial catarrh, especially when young and otherwise vigorous, do well. Almost all forms of anæmia are advantaged. Since the successful introduction of heliotherapy for such a general infective disease as tuberculosis, it has been found that local and general sun-baths are often of service in certain arthritic, auto-toxæmic, and other obscure affections, sometimes giving relief locally, but more frequently improving nutrition and general condition. Certainly, Montana affords an opportunity for adventuring in regard to the alleviation of a number of cases of uncertain origin, in which ordinary medicinal methods of treatment have proved of no avail.

The English Sanatorium at Montana.

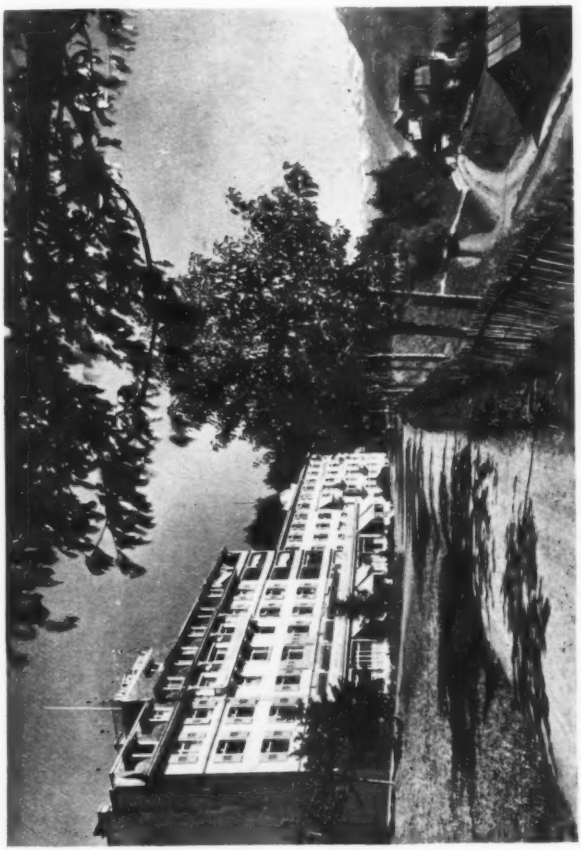
The English Sanatorium at Montana, generally known as the Palace Sanatorium, is an ideal house of healing for British patients. Its management, medical direction, nursing arrangements, and general atmosphere are thoroughly English. Indeed, it is the only sanatorium in Switzerland where doctors, nurses, and superintendents are all English-trained. The British patient, therefore, at once feels at home, for he is among those who speak his own tongue, have the same outlook, understand his ways, and are able to sympathize and to help in all the details of treatment and life under sanatorium conditions. To have an English medical director and a highly-trained staff of nursing sisters, acting under an English matron, are advantages which will appeal at once both to medical advisers and to patients.

It may be of interest to note that, during the Great War, "The Palace" was used as a sanatorium for French, Belgium, and Serbian tuberculous "internés." At the close of the War the sanatorium underwent thorough renovation and was equipped for English patients, the first of whom were admitted in July, 1919.

The sanatorium occupies one of the best sites in Montana. It is situated close to the upper terminus of the Sierre-Montana funicular railway, and facing south has a glorious view of forests and pasture lands extending downwards to the Rhone Valley and across to the snow-clad giants of the Valais Alps. A patient can lie in bed in his own room and look across one of the most famous river-valleys in Europe to some of the most glorious peaks in the Alps. The position of the sanatorium is ideal. It provides an outlook which is unrivalled. Almost opposite is the delightful Val d'Anniviers leading up to Zinal, having on its slopes Chandolin and St. Luc, and backed by the glorious peaks of the Weisshorn, the Rothorn, the Gabelhorn, Besso, and their giant companions. Patients can, if they desire, watch the sun rising over the heights of the Simplon, and in turn lighting up the white peaks

of the Alps on the south side of the Rhone, until at last Mont Blanc is touched with gold. No more entrancing and uplifting outlook for a depressed and enfeebled patient could be found in all Switzerland.

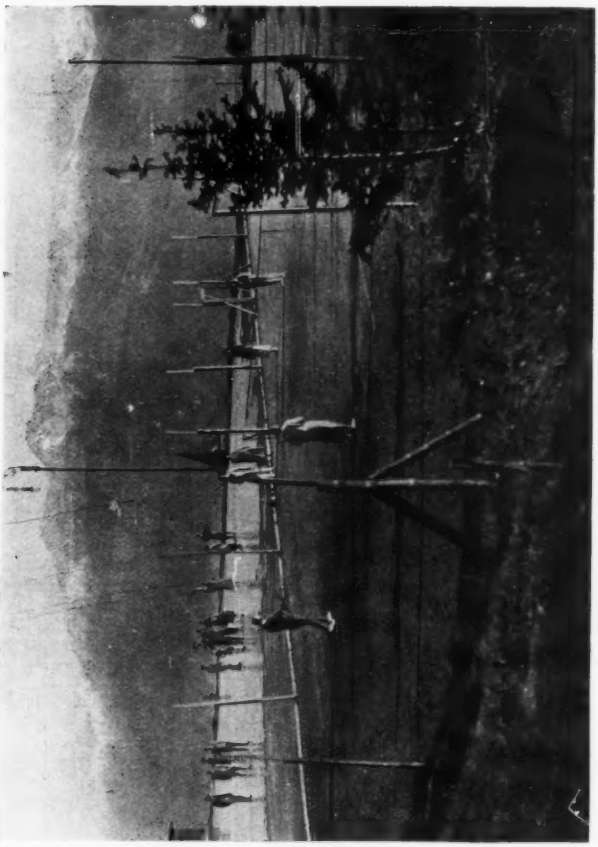
The sanatorium contains rooms for a hundred patients, and most of these face south. A number of rooms open on to a broad terrace, where



MONTANA: THE PALACE HOTEL SANATORIUM.

patients can rest all day in the open. Some rooms have balconies. There are special cure shelters, where sun-baths can be enjoyed and all forms of heliotherapy carried out. On the roof is a solarium providing wind-screens, where patients can, with privacy, undertake general sun-baths or more limited forms of heliotherapy. The general or public rooms have been admirably planned to provide the maximum of

comfort. They are numerous, spacious, lofty, well ventilated, and include large dining-halls, drawing-room, billiard-room, general lounge, etc. The lounge is fitted with an attractive open fireplace. The sanitary arrangements are up-to-date, and include an excellent series of baths. The patients' rooms are equipped and furnished in a



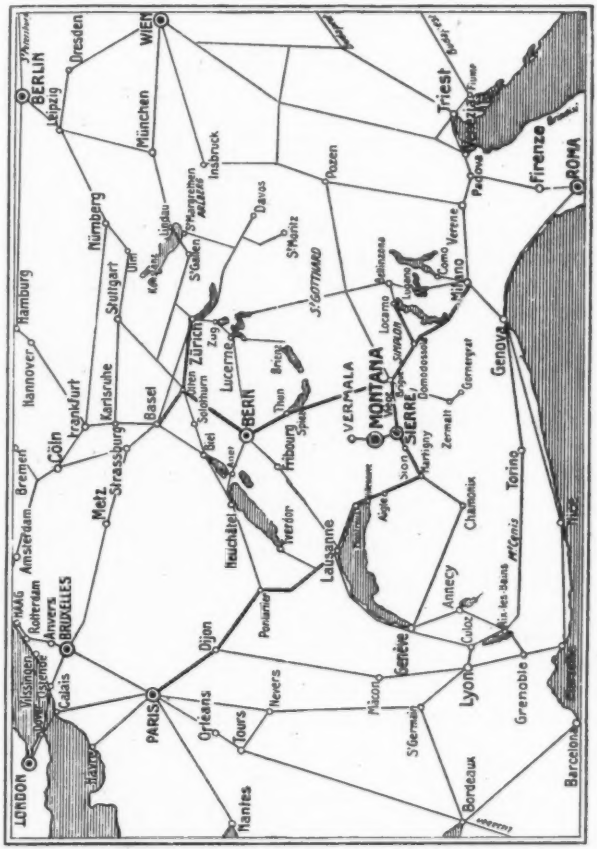
MONTANA: TENNIS AND SKATING BEING ENJOYED IN THE GROUNDS OF THE ENGLISH SANATORIUM ON A WINTER'S DAY.

way to meet the comforts and convenience of English residents. There is a radiator in each room and electric fittings.

The medical department is well equipped, and has recently been thoroughly brought up-to-date. It includes an operating theatre, with facilities for naso-pharyngeal and laryngoscopic examinations, etc.; clinical and bacteriological laboratory; a room for X-ray work, fitted

with a new type of Siemens-Halske apparatus and upright screening stand; and two consulting rooms. The sanatorium also possesses an excellent and ever-expanding library, particularly well stocked with modern works of fiction, travel, biography, etc.

A reference may here be made to the important and very practical question of expense. English patients in the past have often hesitated



MONTANA: MAP INDICATING POSITION AND RAILWAY CONNECTIONS.

to visit Switzerland for treatment because of the uncertainty regarding outlay and the fear of incurring considerable liabilities in the form of so-called "extras." At the English Sanatorium at Montana the patient knows exactly what his financial responsibilities will be. The inclusive fee naturally varies according to the position of the room, from a weekly charge of £6 6s. to £9 19s. 6d. from May 1 to September 30, and from £7 7s. to £11 0s. 6d. from October 1 to

April 30. These charges include bed, lights, heating, full board (consisting of English breakfast, table d'hôte luncheon and dinner, afternoon tea), medical attendance, nursing, and laboratory services. A charge of 5 per cent. is made to cover all gratuities. Invalid dietary when ordered by the medical superintendent is provided without extra charge. No charge is made for meals served in rooms, baths, or for the carrying out of procedures for artificial pneumothorax and X-ray screen examinations.

Residence at the sanatorium provides many advantages which cannot well be obtained at home. It allows of the carrying out of a system of cure all the year round under the very best possible conditions for physical restoration, and permits of the application of the best methods of treatment, especially those in accordance with open-air methods, making full use of all climatological influences and heliotherapeutic measures. The sun-boxes on the roof of the sanatorium provide admirable facilities for sun-bathing under careful medical supervision, and here general or local heliotherapeutic measures can be carried out effectively.

The psychological influence of life in such a centre as that provided by the English sanatorium at Montana calls for reference. Here, not only has the patient the opportunity of gaining the maximum of benefit for his disordered body, but his mental life can be expanded, his interests increased, and a wider outlook established. There are opportunities for the development of various scientific, artistic, and other interests. Arrangements can be made for instruction in French, Italian, German, and other languages, painting, etc. Many patients take up sketching, photography, the study of plant life, and the collection of flowers. It should also be noted that, during the winter, some patients who are well advanced in their cure are enabled to participate to a certain extent, and under medical direction, in some of the milder forms of winter sport such as skating.

A patient sent to the English Sanatorium at Montana is kept in close touch with his or her medical adviser at home, for on admission and periodically reports as to progress are supplied by the medical superintendent. Medical advisers will be interested to know that a special fund has been established to assist in providing financial assistance for duly qualified medical practitioners and registered medical students, both men and women, who have broken down with tuberculosis in the course of their work or studies, whereby during summer months they may enjoy the advantages of treatment at the English Sanatorium at Montana.[1]

[1] Particulars regarding the Special Fund for assisting medical practitioners and students to visit Montana for treatment may be obtained on application to the Hon. Secretary of the Special Medical Fund at 5, Endsleigh Gardens, Euston, London, N.W. 1.

The aim of this paper is a thoroughly practical one: it seeks to provide English medical advisers with information and practical suggestions regarding the residence of an English tuberculous patient under sanatorium conditions in Switzerland, and in a form which the doctor, if he thinks desirable, may pass on to his patient.

HYPOCRINISM IN THE TUBERCULOUS

By HENRY R. HARROWER,
M.D.,
Author of "Practical Hormone Therapy."

It will be my aim in this paper to emphasize the importance of the glands of internal secretion in the clinical response of the individual to an infection with the tubercle bacillus. I hope to show that a consideration of the endocrine glands is just as proper and necessary in the study of the tuberculous as it is in myxœdema, hyperthyroidism, Addison's disease, or, indeed, for that matter, any other clear-cut picture of endocrine derangement.

Physiological Response in the Tuberculous.

First, let me point out that tuberculosis is a typical example of a chronic infective process accompanied by marked nutritional changes, and, let me add, that the functions of practically all of the glands of internal secretion are influenced most decidedly by malnutrition just as they are detrimentally affected by the toxæmia which is inevitably associated with infections. Tuberculosis is a disease of depleted physiology, and it is inevitable that the depletion must extend to the glands of internal secretion equally with other organs of the body. In view of the vital regulating influence of these glands, brought about by their hormones, which arouse, or set in motion, various physiological responses throughout the body, it is obvious that as these tissues are stimulated or depressed, so these functions, responsive to their influences, are equally modified.

For years the impression has been growing that hypotension is virtually pathognomonic of pulmonary tuberculosis. The circulatory syndromes of a very large proportion of these cases include cardio-vascular insufficiency, cold hands and feet, a clammy, poorly reacting skin, and a lack of tone of the cardio-vascular mechanism as a whole, with the inevitable resultant low blood-pressure. It is the rule to find reference in papers and books on tuberculosis to the common and frequently excessive fatigue syndrome, which is one of the earliest manifestations of tuberculosis. This unduly marked tendency to "tiredness" is

not merely muscular, but also cellular or biochemical, resulting in an increased toxæmia, which adds to the depletion or tiredness of the detoxicating mechanism of the body. The muscular atonicity—and fatigue is essentially a form of myasthenia—involves not merely the voluntary muscular system, but also the involuntary system, including all the unstriped muscles, both of the cardio-vascular system and of the alimentary system. This reduced cardio-vascular tonicity is a reason for the low blood-pressure and cardio-vascular symptoms already referred to, just as it is a reason for the digestive disorders and alimentary atonicity so common in these cases.

Metabolism in Tuberculous Cases.

The study of many patients with tuberculosis shows that besides the asthenia and hypotension already mentioned, there is commonly a marked tendency to subnormal temperature—at least, during a part of the time, and especially in those early cases where the extent of the inevitable mixed infection and consequent febrile reaction has not yet become very great. Occasionally the basal metabolic rate has been estimated in certain tuberculous individuals, and at least in advanced and chronic cases, where the nutritional feature has become established, it is practically the rule to find that the B.M.R. is reduced—that is, provided there is no fever at the time the estimations are made.

For years it has been well understood that mal-elimination is common, both in the pretuberculous state as well as in tuberculosis proper. The estimation of the urinary solids will show their elimination to be frequently much below the accepted normal figure. With this, one frequently finds an unduly high urinary acidity, the acidimetric percentage ranging from sixty to one hundred and fifty degrees, while from thirty to forty degrees is the accepted average normal.

Hypocrinism in the Tuberculous.

The picture that I have attempted to outline here is exactly what one finds in that quite common physiological state that I have called *hypocrinism*. By this I mean a functional endocrine insufficiency, a pluriglandular irregularity, involving not merely hypothyroidism, hypoadrenia, hypogonadism, and so forth, but a generally depleted function of the regulators of the chemistry of the body. Hypothyroidism is, perhaps, not quite so common in tuberculosis as hypoadrenia, because I believe that the thyroid gland is a much more resilient organ, and likely to maintain for a longer time its reaction to the various stimuli which later over-stimulate it. Occasionally, therefore, the tuberculous patient is found to be in a state of thyroid irritability; but, as all know, one cannot persistently irritate an organ, year in and year out, without

eventually exhausting it, and I say this in spite of the fact that hyperthyroidism is often of many years' duration.

There are many papers in recent medical literature by such men as Dr. C. E. de M. Sajous of Philadelphia, Dr. Emile Sergent of Paris, Dr. G. Marañón of Madrid, and others, which call attention to the importance of the adrenal glands in infective conditions, and specifically mention the frequency and vital importance of adrenal insufficiency. It will be recalled that the cardinal symptoms of hypoadrenia, equally with Addison's disease, are muscular atonia or asthenia, cardio-circulatory weakness with poor circulation and reduced arterial tension, subnormal cellular biochemical activities with a reduced temperature, deficient metabolism, and poor elimination. Here we have the clinical picture already connected with tuberculosis. So far as I know, the principal difference between functional hypoadrenia and Addison's disease is merely one of degree. The former is functional, extremely common, and quite usually responsive to suitable supportive treatment; while the latter is organic, quite rare, and has a virtually hopeless prognosis.

In conditions where hypoadrenia is found, one usually discovers that there is not merely a purely adrenal incompetence. It is clear that the thyroid evidently secures certain stimuli from the adrenal glands, and just as over-action of these endocrine organs manifests itself in evidences of both hyperthyroidism and hyperadrenia, so with a reduction in the supply of these initiating hormone principles, from the adrenals to the thyroid, there is a coincidental reduction in that chief among the duties of the thyroid gland—the maintenance of intracellular chemistry or metabolism. Besides this, there is a corresponding reduction in the immunizing response of the organism, which is believed by many writers to be related mostly to endocrine, and particularly to thyroid, function. Further than this, it is a matter of considerable clinical importance, which deserves consideration in the study of tuberculosis, that the intimacy of the thyroid and sex glands predicates both thyroid and ovarian dysfunction in many tuberculous women. Therefore, I believe that the condition which I have designated as hypocrinism is a general endocrine depletion. It is a customary finding in the tuberculous, and, in view of the fact that it is now believed that pluriglandular insufficiency can be modified by pluriglandular therapy, there are opened before us prospects for effectively adding to the treatment of tuberculosis by initiating a suitable and indicated organotherapy.

Endocrine Relations in Tuberculosis.

There are many indications in the literature that these endocrine relations are being considered by physicians as never before, and I desire to supplement my own convictions by calling attention to several

of these recent papers, since I believe that the endocrine factor in tuberculosis has not been appreciated as it deserves to be. For instance, Dr. Sichan, of Prague,[1] reports a series of blood-pressure studies in 466 women suffering from tuberculosis. He noted that the worse the case, the lower was the systolic blood-pressure, and found that the pressure tends to increase in the favourable cases. Naturally there were some exceptions to this rule, and I should like to express the belief that the principal cause of an increase in the blood-pressure in well-defined tuberculosis, or perhaps a tension which is not abnormally low, is due to previously established vascular changes which mechanically lessen the degree of blood-pressure variation. This Czechoslovak physician has also found that dysovarism is quite common in tuberculosis, and suggests that the ovarian irregularities may be responsible for at least a part of the vasomotor changes. He also calls attention to the detrimental influence of emotional factors and especially worries. The attention of the reader should also be directed to the epoch-making studies of Cannon and his associates at Harvard University, which showed conclusively that emotional stress, such as fear, rage, pain, hunger, worry, etc., exert a detrimental influence upon the function of the adrenals.

The Mineral Metabolism.

Another feature of interest in the clinical variations from the normal, which are common to the tuberculous, concerns the mineral metabolism. It has become a byword that the tuberculous individual is commonly a sufferer from lime starvation. Evidently the change brought about in the chemistry of the tuberculous favours the loss of calcium salts, and interferes, in some subtle fashion, with the capacity of the body to fix these minerals, and to retain them in the chemical economy. In a recent paper on "Mineral Metabolism and Disease,"[2] Dr. John B. Orr lends proper stress to the importance of the mineral metabolism, especially in tuberculosis, and calls attention to the fact that in this disease there is usually a "negative calcium balance." One of the reasons that milk has become so important a part in the therapeutic dietary of the tuberculous is because it is, perhaps, the best and most convenient source of lime salts, and, as is generally acknowledged, lime is one of the most needed minerals in tuberculous disease.

The study of the mineral metabolism of tuberculosis, and the appreciation of the importance of lime starvation, have aroused very considerable interest in another series of endocrine organs—the parathyroids. It is now believed that these little glandules have a remarkably active lime-fixing power, or that they produce a mordant whereby

[1] Sichan: *Casopis lekarur ceshych*, December 22, 1924, lxiii., 1892.
[2] Orr: *Practitioner*, January, 1925, cxiv., p. 352.

the body is able to retain lime salts which otherwise would be excreted. A number of physicians are now considering the possibilities of parathyroid therapy alone or in conjunction with lime as a useful procedure in the treatment of tuberculosis, and it is my personal opinion that there is more likelihood of revolutionizing the nutritional phases of tuberculosis in this fashion than in any other that has been under consideration during the past fifty years.

There are a number of references in the literature to the fact that parathyroid therapy is being considered in relation to tuberculosis, and a recent paper by Pelouze and Rosenberger[1] reports "the interesting behaviour of tuberculous guinea-pigs under parathyroid and calcium administration." They based their experiments upon the theory that as the parathyroid glands evidently were the controllers of the calcium metabolism, the underlying factors in the mineral irregularities of tuberculosis might be the result of a hypoparathyroidism, and that, since in tuberculosis there is a lessened calcium balance, it might be possible that a deficient parathyroid secretion was preventing the absorbed calcium from taking part in the true action for which it was needed. These writers call attention to the fact that there has been much controversy over the function of these small glands, but state that "it is clear that their action in relation to calcium metabolism is now well established." In consequence of this position, these writers determined to see if the administration of lime and parathyroid, separately and combined, would in any way influence the course of tuberculosis in guinea-pigs. The results of their experiment, in both tuberculous and non-tuberculous animals, warrant the following conclusions: (1) The lesions were greater in the tuberculous controls and less marked in the calcium-fed animals. In those given parathyroid and in those getting both substances the lesions were still less marked. (2) The weight gained bore an inverse relation to the size of the lesion as would be expected, and was much greater in those placed upon the combined medication. (3) Tuberculous animals receiving both the drugs gained far more than either of the other groups and even more than the normal guinea-pigs under like condition. These writers come to the conclusion that their results "strongly suggest that similar effects might be obtained in certain classes of patients with tuberculosis," and it is interesting to know that for years prior to this animal experimentation, this information had been applied by certain empirical workers with results that are just now attracting the attention of the profession.

Another organ which I believe exerts an important nutritional influence, especially in tuberculosis, is the spleen. It is too long a story

[1] Pelouze and Rosenberger: *American Journal of Medical Science*, October, 1924, clxviii., p. 546.

to go into fully, but it may be added that the suggestion which I made in an article published in this journal[1] in 1913, as well as in a previous article,[2] calling attention to the important possibilities of spleen therapy in hæmopoiesis, and especially the nutritional features of tuberculosis, is receiving added attention at present. I might add that in the last three years clinical experience has been supplemented by some remarkable laboratory figures, which indicate that spleen therapy not merely is a valuable hæmopoietic, but exerts a definite influence upon the metabolism of lime, and supplements in a decided fashion the calcium-fixing influence of parathyroid therapy that has been referred to above.

Dysovarism in Tuberculous Women.

Before closing, I should like to lend additional emphasis to the importance of dysovarism in tuberculous women. The intimacy between the thyro-adrenal mechanism and the sex glands is such that stress brought about by derangement of the ovarian function is likely to lessen the capacity of the thyro-adrenal mechanism to carry out its functions that have already been referred to. In other words, the tuberculous woman with menstrual irregularities is "set back" so much the more when these endocrine glands have to take their attention from their detoxicating and immunizing duties to attempt to straighten out an ovarian irregularity. Recently, Dr. S. Somogyi, a Hungarian physician, published an interesting study on menstruation and tuberculosis.[3] He shows that the studies of different authors, especially Halban, have demonstrated the relation of the menstrual period to other endocrine processes. The periodical hormonic changes modify the function of the associated endocrine glands, and are responsible for some of the marked changes in the autonomic nervous system which so commonly are found in conjunction with menstrual irregularities. This relation between menstrual disturbances and the sympathetic nervous system serves to explain certain common relationships between the menses and tuberculosis, in which differing vagotonic and sympathicotonic symptoms are observed. The sympathicotonia of the severe toxæmic type of tuberculosis is believed to exert an inhibitory action upon the menses, and, therefore, may actually cause amenorrhœa. In vagotonics, on the other hand, dysmenorrhœa often occurs, and the author goes so far as to attribute certain types of dysmenorrhœa to a vagotonia which varies with changes in the activity of the tubercular process. Personally, I have encountered a number of cases of endocrine disturbance, involving the thyroid and the sex glands, which were very considerably exaggerated by the development of tuberculosis, and in

[1] Harrower: *The British Journal of Tuberculosis*, 1913, vii., p. 170.
[2] Harrower: *The Lancet*, 1913, i., p. 524.
[3] Somogyi: *Beitrage zur Klin. d. Tuber.*, Berlin, October 25, 1924, lix., p. 609.

turn in these same cases the periodical irregularities of the menstrual period so lessened the resisting powers of the body that the tuberculous process was permitted to take a firmer grip each month. Happily, in several of these cases, the endocrine regulation of the ovarian dysfunction not merely modified the menstrual findings dependent upon these irregularities, but also evidently stopped the progress of the tuberculosis, or, at least, lessened the headlong downfall which appeared imminent at every menstrual experience.

Hypocrinism and the Treatment of the Tuberculous.

In conclusion, I should like to express the opinion that the consideration of these vital regulators of the chemistry of the body is as important as any other feature of the study and treatment of the tuberculous, and as soon as the profession accepts fully the doctrine that the endocrine glands are the regulators of the chemistry of the body, of the resistance of the body to infection, and of immunity, the better will they be able to appreciate how to extend the treatment of tuberculosis so as to include measures calculated to modify these important and far-reaching endocrine abnormalities. The support of the inevitably depleted endocrine glands in conjunction with dietetic and other essential therapeutic procedures in tuberculosis may make all the difference in the world to the successful outcome of a treatment which previously was "almost complete, but not quite."

A particularly good article appeared in a recent issue of the *Prescriber*,[1] in which Dr. G. Y. Oliver in a paper on the treatment of tuberculosis in general practice draws attention to the endocrine features in a most pleasing manner. He insists on the diagnostic importance in early tuberculosis of the usual drop which occurs in blood-pressure, and which many believe to be due to hypoadrenia. He also lays stress on the frequency with which the B.M.R. is abnormal, due, at first, to the toxic irritability of the thyroid, and later to the superinduced exhaustion of this endocrine mechanism. Dr. Oliver also rightly places emphasis upon the frequently overlooked acidosis which often occurs in these cases and the coincident calcium loss, and refers to the possibility of regulating it in connection with other forms of treatment.

I should like to refer to another important matter. For some years French authorities have been impressed with the value of hepatic organotherapy in tuberculosis. Several references to this subject were made in my last paper in this journal.[2] Since the separation of insulin it has been natural that renewed efforts should be made to prepare

[1] Oliver, G. Y.: "The Treatment of Tuberculosis in General Practice," the *Prescriber*, August, 1925, vol. xix., No. 227, p. 279.

[2] See article in *The British Journal of Tuberculosis*, 1913, vol. vii., p. 170.

more active products from other organs. Among those now being studied in my clinic, special reference may be made to the active principles of the spleen and liver; the former has been referred to above, but the latter deserves mention. It is believed that the homostimulative influence of the hepatic endocrine principle increases detoxication by assisting (possibly by catalysis) in the anabolic functions of the liver which have to do with the fitting together of the precursors of the nitrogenous waste products (especially urea) preparatory to their elimination. Dr. W. J. Macdonald recently read a paper before the Ontario Medical Association[1] indicating that he believed in a hepatic internal secretion, and that it has a remarkable depressor action. Whether these principles are the same I do not know, but at least there is a greater appreciation of the endocrine value of this great gland, and there are good prospects that it may have an increasing vogue as a detoxicant.

THE LATE RESULTS OF RENAL TUBERCULOSIS.

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Spontaneous healing of tuberculous foci has been observed in almost every organ of the body, and one naturally asks whether it is not possible to bring about a cure of renal tuberculosis without sacrificing the kidney. If this should be the case, it is obvious that nephrectomy for renal tuberculosis is scarcely to be viewed as a justifiable operation—at least, so long as the infected kidney contains a fair amount of secreting tissue. No one could object to the removal of a functionless organ, though some might consider it unnecessary. The whole question can be concisely summarized. Should the patient be advised to submit to a nephrectomy as soon as unilateral renal tuberculosis is diagnosed, or are we justified in trying medicinal treatment first, and only advising a nephrectomy if these methods fail? The answer depends, first, on the efficiency of medical methods, and, secondly, on the dangers incurred by delay. Urologists have definitely answered this question. They are unanimous in advising early operation, but their conclusions do not seem to be entirely accepted by the general members

[1] Macdonald, W. J.: *Proc. Soc. Exper. Biol. and Med.*, 1925, vol. xxii., p. 483; also see *Canadian Medical Journal*, July, 1925, vol. xv., p. 697.

of the medical profession, judging from the obvious reluctance with which the question of nephrectomy is usually approached. My object in this paper is to give a brief account of the reasons why we consider nephrectomy the best treatment for urinary tuberculosis, and why we advise patients to submit to operation as soon as possible after the diagnosis of renal tuberculosis has been made.

What are the Results of Medicinal Treatment of Renal Tuberculosis?

Under this heading I include the administration of tuberculin and other specific remedies.

1. *What is the Duration of the Disease?*—Urinary tuberculosis, which, by the way, always originates in the kidney, is a very fatal disease, and destroys life more rapidly than is usually supposed. I have only seen two cases survive for more than ten years. One refused operation thirteen years before, and asked me to remove his kidney a week before he died. He was then in a deplorable and absolutely hopeless condition, and died from suppression of urine which came on suddenly while he was still under observation. The other had been on tuberculin treatment for a little over twelve years, but was then suffering from renal insufficiency, and could not have lived for more than a few weeks longer. Rafin collected statistics of 168 patients who had not been operated on, and whose history was followed up either by himself or by their own physicians. At the time of the enquiry, 91 were dead and 77 alive. Taking the fatal cases first, 29 died within two years from the onset of the disease, 30 died in the next three years, a further 27 died between the sixth and the tenth year, while only 5 lived for more than ten years. Of the 77 who were alive at the time of the enquiry, in 18 the duration of the disease was less than two years, in 19 it was between three and five years, in 28 it was between six and ten years, and in 12 it was over ten years. Rafin also noted the cause of death in 74 cases. In only 4 of them it was due to intercurrent disease; in all the others it was the direct result of either local or generalized tuberculosis. One interesting point appears in Rafin's statistics. The disease appears to be more chronic in the female than in the male. In the fatal cases the average duration of the disease was three and three-quarter years for males, and five and three-quarter years for females. Even in the non-fatal cases the same difference was noted, the average duration being four years and four months in the male, as against five years and five months in the female. It is probable that this difference is due to the tendency for the infection to spread to the genital organs in the male. In a report to the Third German Congress of Urology, Wildbolz gives the results of an enquiry addressed to Swiss physicians.

He collected information regarding 316 cases of renal tuberculosis. At the time of his circular, 218 were dead and 98 alive. The duration of the disease in the fatal cases was as follows: In 99 it was less than two years, in 86 it was between three and five years, in 20 it was between six and ten years, in 8 it was over ten years, and in 5 the duration was not noted. With very few exceptions all these patients died of tuberculosis. The duration for the 98 living cases was under five years for 40, from five to ten years for 18, and over ten years for 12, while in three cases it was not noted. Furthermore, 68 of these 98 cases still suffered from severe symptoms of urinary tuberculosis. Other writers give figures which are very similar, so I feel we may accept them as being approximately correct. The net result of medicinal treatment, therefore, appears to be that only about 10 per cent. of patients live for more than ten years after the onset of symptoms.

2. *What is the Condition of the Survivors? Are they Cured?*—There is no doubt as to the answer. It is decidedly in the negative. The great majority of the survivors are still suffering from the distressing symptoms or urinary tuberculosis, and, in fact, most of them are dying from it. The clinical cures are so rare that they require special mention. They are even so rare that they do not appreciably influence the statistics. We must therefore look for them either in pathological records, or else examine the few isolated cases which have been described as natural cures.

First as to the pathological evidence. Fibrous nodules have been found on post-mortem examination in the kidneys of patients who have died from pulmonary tuberculosis. These have been described by Bedo Hobbs, Péchère, and others. Some of these nodules were as large as a pea, and the supposition is that they were the scars of healed tuberculous lesions; but as far as I can ascertain, none of these patients presented symptoms suggestive of renal infection during life. Delbet found one case where a tuberculous nodule had become calcified in 230 cases he had examined. He also pointed out that in a considerable number of cases there was some attempt at a cure. Certain foci became surrounded, or partially occluded by fibrous tissue, but fresh tubercles always developed elsewhere in the kidney. The tendency towards fibrosis is, as a matter of fact, quite common, and must have been noticed by everyone who has seen many tuberculous kidneys, but it is always incomplete. Renal tuberculosis is only diagnosed when pus and tubercle bacilli are found in the urine. There is no means at present at our disposal for making the diagnosis before this stage is reached. In other words, the tuberculous lesion, or some part of it, must be connected with the renal pelvis or calyces. Once this happens, I do not think there is any evidence that a spontaneous cure ever occurs—at least, while the kidney retains a portion of its functional

value. I do not believe the tuberculous process ever becomes completely arrested until the kidney is totally destroyed.

And now as to clinical evidence. The majority of patients suffering from renal tuberculosis retain their symptoms as long as they live, but occasionally cases are met with where the urine becomes clear, and is free from pus and tubercle bacilli, and where the pain and frequency of micturition gradually disappear, and the patient appears to be restored to health. If these claims are examined, it is usually found that the ureter on the infected side has become obliterated, and the kidney completely shut off from the bladder. The vesical lesions heal rapidly, as they always tend to do, once the supply of tubercle bacilli coming from the kidney is cut off, and as the symptoms are mainly vesical, the patient feels comparatively well. Occasionally, however, the spontaneous disappearance of symptoms may take place without obliteration of the ureter, but only when the kidney has become completely destroyed. I think the following case belongs to this group: A girl of sixteen developed pain and frequency of micturition. Pus and tubercle bacilli were found in her urine. She was treated for over five years by regular weekly injections of tuberculin, under the mistaken idea that she was suffering from vesical tuberculosis. She was examined by means of the cystoscope on several occasions, but, as far as I can ascertain, her ureters were not catheterized. At the end of five years she began to improve, and a year later she was pronounced cured. Three years afterwards she married, and in a year's time became pregnant. During the third month she complained of intense pain in the right side, accompanied by high temperature and rigors. The urine became purulent, and every three or four days she passed a large amount of foul-smelling pus, which slightly diminished the intensity of her general symptoms. I first saw her when she was in this condition. The right kidney was very much enlarged and extremely tender. On cystoscopy, the right ureteric orifice was "dragged out" and "golf holed," and the ureter itself thickened. Thick yellow pus was coming down it. The left ureter was normal, and clear urine was issuing from it. As her condition was urgent, the right kidney was immediately removed. It was a huge pyonephrosis, in which no trace of secreting tissue could be made out on naked-eye examination. The ureter was about as thick as the index finger, and was obviously tuberculous, but its lumen was dilated throughout its whole length. The patient recovered after a long convalescence, and carried the child to term. I have no doubt that this patient suffered from a right-sided renal tuberculosis, which only cleared up when the kidney became functionless. Her urine was reported as being free from pus and tubercle bacilli before her marriage, but this is not absolutely conclusive, as no inoculation experiments were carried out. For about

four years there were no renal symptoms, and the kidney might have remained "silent" for much longer if her pregnancy had not caused it to flare up. It must, however, be remembered that this patient was lucky to have escaped with her life, and that an early nephrectomy done when the risk was small would have saved her five years of invalidism.

Obliteration of the ureter on the infected side is a much more common cause for the cessation of symptoms. The following case is an illustration of renal occlusion: A male, aged thirty-eight, a farm labourer, presented himself at my out-patient clinic at St. Peter's Hospital in October, 1920, complaining of pain in the left side. He stated that during the years 1916 to 1918 he had suffered from great frequency of micturition. This was so severe that for almost twelve months he had nocturnal incontinence. During the year 1919 these symptoms gradually cleared off, and for a short time he thought he was cured. However, early in 1920 he began to suffer from pain in the left loin, which steadily increased in severity until he came for advice. On examination, neither kidney could be palpated, but the left loin was distinctly tender to pressure. The urine was normal. On cystoscopy, the bladder mucous membrane was normal, no sign of tuberculous ulceration being noted. The right ureteric orifice was normal, and large quantities of clear urine was coming down it. The left ureteric orifice was only represented by a dimple, across which the bladder epithelium had grown. The trigone was dragged out to the left, and X-ray examination was negative. It was obvious that the left kidney was completely shut off from the bladder, and in view of the patient's history, and of the distortion of the trigone, a tentative diagnosis of closed renal tubercle was made. I removed the kidney, which was rather smaller than normal, and was composed of a series of tuberculous cavities communicating with a dilated and thickened renal pelvis. The ureter was patent in its upper part, but no instrument could be passed down it into the bladder. This patient completely lost his pain as the result of the operation, and put on three stone in weight within four months of his discharge from hospital. This type of occlusion is so well known that the term "autonephrectomy" has been applied to it. The question naturally arises as to how these patients compare with those who have undergone a surgical nephrectomy. An occluded kidney is either completely hollowed out or is transformed into a caseous mass. In the cavernous type the fluid in the cavities is sterile, but tubercle bacilli can be seen in stained sections of their walls. In addition, Braasch inoculated guinea-pigs with an emulsion from five kidneys of this type. In four cases the animals remained normal, but the fifth died of diffuse tuberculosis. It is well known that caseation does not necessarily mean the death of the tubercle bacilli, so that in

both types the patients are liable to suffer, and as a matter of fact do suffer, from absorption of bacterial toxins. Again, an occluded kidney may be the starting-point of a perinephritic abscess, and, lastly, it may be the source from which the other kidney becomes infected. Therefore, "autonephrectomy" cannot be considered as a cure of renal tuberculosis, and the term is a bad one, as it gives rise to a false sense of security.

But it may be asked, What about the cessation of symptoms with preservation of the functional activity of the kidney? This, of course, is the ideal result, but is it ever attained? Obviously never in cases submitted to nephrectomy, but something of this nature has been observed in a very few cases. However, when they are examined, it is found that most, if not all, of them are cases of occlusion of a portion of the kidney. This may happen in several ways. If a kidney has a double ureter, or if the ureter divides low down, one branch may drain an infected portion of the organ and the other a healthy portion. It is conceivable that the branch draining the infected portion may become occluded, just as we have seen the whole ureter occasionally becomes impervious. I do not know of any case of this type reported in the literature of the subject. Heitz-Boyer has reported a case where the upper calyx, which alone was tuberculous, became occluded. Legueu illustrates a specimen of the same nature from the museum of the Necker Hospital. Wildbolz gives a short clinical history of a case in which he found pus and tubercle bacilli coming from a kidney which was almost normal, as viewed from its functional aspect. Five years later he examined the urine on two separate occasions. On both examinations he found it to be normal, and it did not infect a guinea-pig. A chromocystoscopy showed good functional power of both kidneys. This patient was in good health six years after the onset of the illness. Unfortunately, a pyelography does not appear to have been made, as it would have shown if a portion of the renal pelvis was obliterated. Even a partial occlusion does not necessarily mean a cure, as an active tuberculous focus is left behind. It is merely shut off from the rest of the urinary tract.

General Conclusions.

From this very brief résumé it will be seen that: (1) Renal tuberculosis treated by non-operative methods is generally fatal. About 90 per cent. of the patients die from the direct effects of their infection. (2) That the majority of the so-called cures are really cases where the kidney becomes occluded, and the tuberculous process is not arrested, but is merely shut off from the rest of the urinary tract. (3) There are a few instances in which a portion of the kidney has become

occluded while the remainder of the organ continues to functionate, but they are so rare that they are pathological curiosities. Further, these cases are not cured, as they still suffer from a closed tuberculous focus. On the whole, I think that the possibility of a natural cure of renal tuberculosis which has reached a stage in which it can be diagnosed by clinical methods has not yet been proved.

Surgical Treatment.—It has been urged that there is a sacrifice of healthy renal tissue involved in every case where a nephrectomy is performed early. This is most apparent on naked-eye examination of the specimen. But if the functional power of these tuberculous kidneys is investigated, it is always found to be surprisingly low, and quite out of agreement with the naked-eye pathological findings. At the same time, the functional activity of the opposite kidney is usually above normal. This is an indication that the diseased organ has not done its fair share of work for some time, and that its fellow is in consequence becoming hypertrophied. If, for example, we examine the functional activity of two kidneys, one tuberculous and the other involved in malignant disease, and supposing that approximately the same amount of secreting tissue has been destroyed in both cases, the malignant kidney invariably gives a much better response to the functional tests than does the tuberculous. The reason for this is found on microscopic examination, when, in addition to the obvious tuberculous lesions, a certain amount of nephritis is always noted. Therefore, the sacrifice of healthy tissue involved in an early nephrectomy is only apparent, and not genuine. A tuberculous kidney, even in its earliest recognizable state, is a badly damaged organ.

What are the Results of Operative Treatment?—The immediate mortality has steadily decreased during the last twenty years. This is due to a more careful operative technique, and also to a more exact investigation of the cases before operation. The operative mortality at the Mayo Clinic is 2·7 per cent. for 863 cases. Wildbolz had 11 deaths following 445 nephrectomies—that is, 2·4 per cent. The mortality at St. Peter's Hospital is 4·4 per cent. Legueu and Chevassu collected 1,539 cases, with an operative mortality of 5·9 per cent., while Boeckel's collection of 2,289 cases gave a death-rate of 5·8 per cent. From these statistics we may take it that the average operative mortality is approximately 5 per cent. In addition to this immediate mortality, there are a large number of post-operative deaths, which are either directly or indirectly due to the disease. This late mortality is approximately 15 per cent., and although various authors give statistics which vary somewhat, the chief causes for it are pulmonary tuberculosis, general miliary tuberculosis, and disease, either tuberculous or not, of the remaining kidney. The total mortality is therefore in the neighbourhood of 20 per cent.

What is the Expectation of Cure under Surgical Treatment?—It is obviously difficult to define the term "cure" when dealing with a condition such as urinary tuberculosis, where the disease may remain quiescent for considerable periods of time, but Wildbolz accepts patients whose urine has remained free from pus and tubercle bacilli for three years and upwards as cured, and I think this is a fair conclusion. He found that on this assumption 58·9 per cent. of his patients were cured. This figure agrees very closely with those of Judd and Scholl from the cases operated on in the Mayo Clinic. They obtained post-operative data of 611 patients, and found that 58·6 per cent. were "completely cured on an average of four years after operation," 31·2 per cent. were dead, and 10·1 per cent. still suffered from urinary trouble. These figures are really better than appears at first sight, as almost half the deaths were due to causes other than tuberculosis. We may therefore sum up the results of surgical treatment as follows: The total mortality is about 20 per. cent., the cures amount almost to 60 per cent., while the remaining patients still suffer from tuberculosis.

Can these Figures be Improved Upon?—It is notoriously dangerous to attempt to forecast what may happen in the future, as some entirely new and revolutionary method of treating tuberculosis may be discovered at any moment. However, at the present time there does not appear to be any indication of such a change. Even those who have most experience in heliotherapy recognize that renal tuberculosis is not profoundly influenced by this method of treatment, and still requires operation. I shall therefore assume that for some time to come, at all events, nephrectomy will be considered to be the correct treatment for renal tuberculosis. At present a large proportion of cases are only sent to us when it is too late to arrest the disease. Out of 99 consecutive admissions for urinary tuberculosis into St. Peter's Hospital, only 48 nephrectomies were performed. After making allowances for readmissions, I found that one-third of the cases were inoperable when first seen. The large amount of readmissions is due to the fact that many patients were examined three or four times before an absolute diagnosis was made, and, furthermore, that these patients, almost without exception, suffered from bilateral infection. I feel certain that if patients were sent for investigation as soon as the tubercle bacilli were found in the urine, we could show much better results. Is it too much to expect that a bacteriological examination of the urine should be made within twelve months of the onset of vesical symptoms? Yet if this was done, and if the patients were immediately sent for catheterization of the ureters and examination of the separated urines, I believe that the operative mortality would be negligible, that the late mortality would not be more than 10 per cent., and that the ultimate cures would be at least 75 per cent.

THE DANGER OF TUBERCULOUS INFECTION FROM MIGRATORY CONSUMPTIVES.

By W. BOLTON TOMSON,
M.D.,
Vice-President of the Hastings and St. Leonards Tuberculosis Care Committee.

Among the social causes responsible for the spread of tuberculosis must be included the migratory habits of many men and women suffering from pulmonary forms of the disease. A considerable number of these temporarily inhabit one or more rooms in our health resorts. Very many of these patients are comparatively poor, sometimes subsisting only on a small pension. Frequently they are sufferers from pulmonary tuberculosis in a very chronic form. They reside in private houses that have apartments to let. The danger from this poorer class of visitor applies particularly to health resorts and seaside towns, and is one of the penalties they pay for their attractiveness. These cases have often left London and other large centres on account of their health; they do not consult a doctor, if they can possibly help it, in the fresh locality to which they go to live, and therefore they are not notified and are under no restrictions whatever. They can live in apartments near the sea very cheaply during the off-season provided they leave them when the season commences. Unfortunately there are landladies ready to welcome them, and who do not mean to spend either in money or labour more than they can help on the rooms they let. Scrupulous cleanliness with such is at a discount; and no regard is given to disinfection. Consequently when the tuberculous tenant leaves these rooms they most certainly would not be disinfected, and they would probably be very imperfectly washed and cleansed. Sometimes the landlady lets for some months to the same tenant, and then during the season to a succession of visitors. In the latter case the blankets oftentimes are not changed frequently. It is quite a common practice to run the sheets through a mangle to give them the appearance of not having been used.

The rooms used by a tuberculous subject may then be inhabited by a person with lowered bodily resistance, visiting the sea to recuperate after some depressing illness such as influenza, or the apartments may be taken for a delicate child who passes part of its time playing with its toys on the floor, where the infected dust accumulates. It seems morally certain that numbers of people date their infection from surroundings such as these. Tuberculosis Care Committees, where they exist, sometimes come in touch with these tuberculous cases either through their official or voluntary visitors who are working

among the poor, or by the patients themselves becoming known on account of financial distress, and then applying to the Committee for help.

Control over tuberculous visitors is always irregular, uncertain, fortuitous, and only a very limited percentage of them are heard of or controlled at all. The following are some typical cases that have been on our lists, and thus they and their dwellings have come under observation.

1. An ex-service man of early middle life, with 100 per. cent. pension on account of tuberculosis, was living alone in a small dirty room overcrowded with furniture and hangings. He occupied much of his time in knitting soft woolly wraps, which he raffled at Christmas time. Delicate people probably bought them to wind round their necks and mouths in cold weather. They seemed specially adapted for inhaling the tuberculous germs with which he, no doubt, infected them. A child recently developed tuberculosis in the same house.

2. A middle-aged single man, suffering from chronic pulmonary tuberculosis, was almost a mentally deficient. He had no relations or friends to look after him, and was inhabiting a single room by the sea which he would be obliged to leave as soon as the season commenced. He would certainly be most unlikely to carry out properly any disinfection of his sputum, or adequate cleansing of his sputum flask. Indeed, he probably did not realize his responsibility to others.

3. A poor woman with chronic tuberculosis and living alone was inhabiting two rooms and expectorating very freely sputum containing tubercle bacilli. She told me she never took a flask with her when she went out, saying: "Women never do; they haven't the pocket to put them in; I always spit down the drains."

4. Two sisters, both suffering from pulmonary tuberculosis, lived together in two rooms in a poor cottage. They had been receiving visits from members of our Committee for some time, when a visitor, on calling, was surprised to find them gone. They had left the town without telling us of their intentions, but before doing so we learned that they had sold their belongings, consisting of dirty and dusty furniture, carpets, and hangings, to a second-hand dealer. Old infected articles of this description must be a not infrequent means whereby the germs of tuberculosis are carried into the houses of the poor.

To try and prevent tuberculous infection by such agencies as the above, I would venture to offer for consideration the following statements and suggestions:

1. In seeking means for the prevention and arrest of tuberculosis, I think it will be generally admitted as an obvious truism that measures for the control and disinfection of the tuberculous sputum is of the utmost importance, and that the first thing to do is to agree as

to the guiding principles of action by which this can best be accomplished.

2. The tuberculous patient must be under supervision as long as he or she is at large. This applies more particularly to those who are deficient (*a*) in education; (*b*) in a sense of moral responsibility. Dr. Marcus Paterson, at a tuberculosis conference, expressed the opinion that a tuberculous patient who set all rule and authority at defiance was more dangerous to the community if uncontrolled than a lunatic. It was a remark that struck me forcibly at the time, and now with a greater experience I most emphatically endorse it.

3. It is advisable to perfect our system of notification. Health Authorities should notify one another whenever possible regarding the movements of tuberculous patients, so that a Medical Officer of Health may know the address of every consumptive arriving in his locality. I am here referring more especially to Circular 549, issued by the Ministry of Health, December 22, 1924. On p. 3, para. 1, under the heading "The Keeping of the Register," appears the following note: "In County Areas the Minister has no doubt that County Councils and Tuberculosis Joint Committees will be prepared to arrange for their Tuberculosis Officer to communicate such information to the District Medical Officer of Health as well as any information which may be in the possession of the Tuberculosis Medical Officer as to deaths *or removals* from the *district of persons who have* been under *supervision*, whether or *not* accompanied by domiciliary or other active treatment under the Tuberculosis Scheme." I would also direct attention to the remark in the next paragraph on "information from other sources." (The italics are my own.)

4. That the *onus* of notification should rest upon the patient, him or herself, so that when a tuberculous adult who has been certified as suffering from pulmonary tuberculosis goes to live in a fresh locality, it should be his or her legal duty to notify it to the right authority. This is my main contention, and I am perfectly aware that it is a proposition that would give rise to protest from a section of the public. It is a case where sentiment may easily overrule judgment. As bearing on the matter as viewed from the legal aspect, I would refer to the well-known Collins-Hopkins case, which dealt with (to quote the newspaper headlines): "A Tenant's Right to leave Infectious Houses" and to provide "The Seeds of Death in Furniture." *The Times* of June 21, 1923, in a leading article on this case comments under the heading "Health Conscience" thus: "It is one of the oldest principles of social life that the calamity of an infectious illness imposes on the victims the duty of taking such measures as may be within their power to protect others from danger."

When notified (by whatever means) and registered, every consump-

tive should be visited by the Medical Officer of Health or a skilled tuberculosis visitor. All tuberculous cases and their surroundings should be under control. The Tuberculosis Care Committee can help these sufferers when necessary, and their rooms would be disinfected when vacated. The necessity for stripping and repapering the walls of a room occupied by a consumptive may be learned from an article on "The Sanitation of Wall-Papers," which appeared in the April number of *Health*.

5. I would suggest that a still further advance would be to develop *the principle of segregation*. It would be enormously to the advantage of the patient as well as the public if cases similar to those I have described could live in houses or hostels especially adapted to their needs. For the price they pay for non-hygienic rooms, and expensive in comparison with their income, and considering the little value they receive, these patients should be able to obtain apartments suitably furnished, easily cleaned, and dust-free. Attention should certainly be directed to the provision of quarters properly ventilated, warmed, and exposed to sunlight. The proposed establishment should be under the management of a woman who possessed a knowledge of housekeeping and had undergone a special training for the work and understood the habits of the poor. Such a one might be found among tuberculosis visitors. She would be able to control the lives and habits of the inmates. I have met official tuberculosis visitors whose work in this capacity would be invaluable. These arrangements would go far to limit one cause of tuberculous infection, and what a change it would be for some of the chronic cases now undergoing what is euphemistically called "domiciliary treatment"!

These last ideas are somewhat on the lines of the so-called "Home Hospital" methods, which are now being carried out in New York and other parts of America. Not only do these procedures materially control the dangerous sources of tuberculous infection, but judging from medical results it is said to compare most favourably with sanatorium treatment.[1]

[1] See an interesting article by Dr. J. A. Kingsbury, Secretary to the Milbank Memorial Fund, New York, in the February issue of *The World's Health*, p. 66.

THE MORLAND CLINICS AT ALTON.

By Sir HENRY GAUVAIN,
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Medical Superintendent, Lord Mayor Treloar Cripples' Hospital and College, Alton, Hants.

The Morland Clinics have been established to meet the requirements of patients requiring prolonged and skilled treatment in the country and who are especially likely to derive benefit from sun or artificial light therapy. Such patients have hitherto, because of lack of adequate facilities for such treatment in this country, been almost compelled to seek assistance in continental clinics. The disadvantages of this are too evident to need emphasis.

Morland Hall, conveniently situated in a secluded position, at an elevation of about 400 feet, on the outskirts of Alton, Hampshire, in a healthy locality of proved suitability and in its own extensive grounds, is meeting a very real need. The district is sunny, the subsoil chalk and well drained, and the grounds well timbered. During the summer months the amount of sunshine available for treatment is high, and the mildness of the climate makes outdoor treatment possible during the greater part of the year without discomfort to the patients. Morland Hall is of modern construction, centrally heated, has its own electric supply, is connected with the town gas and water mains. The rooms are lofty and well ventilated. Specially designed solaria have been constructed, giving ample accommodation for natural sun treatment and provided with shelters or sliding roofs as a protection against showers of rain, rendering it unnecessary for patients to return indoors if the weather is inclement. A balustraded terrace is reserved for the use of children. There are also conveniently situated and adequately equipped rooms for operative treatment, physiotherapy, radiography and radiotherapy, massage, plaster application, and other methods of treatment.

The two Light Departments are equipped with various forms of modern arc lamps, including carbon, cored carbon, tungsten arc and mercury vapour lamps. In addition a Finsen-Reyn lamp with full range of water-cooled quartz compressors is installed for the local treatment of lupus. There are the fullest facilities for general light baths and intensive local light treatment, the varying apparatus permitting the employing of ultra-violet light, radiant heat and light of varying wave lengths in combination or separately. For those too ill to be treated in one of the Light Departments a specially designed portable triple arc lamp has been installed, enabling patients to obtain

general or local light baths of desired wave length and intensity in their own beds.

Type of Patient admitted.—While special provision is made and equipment provided for patients suffering from all forms of non-pulmonary tuberculosis, for whom any form of splints or appliances can be manufactured at the clinics, admission is not restricted to these. Patients are also admitted suffering from non-infectious conditions especially likely to benefit by open-air, sun, and artificial light treatment. Cases accepted include various orthopædic conditions, rickets, debilitated or pre-tuberculous children, sufferers from various

THE MORLAND CLINICS, ALTON.

Note sliding roof on balcony in foreground.

forms of arthritis, anæmia, neuritis, convalescents from operations or severe illness and other conditions requiring lengthy and careful treatment. Patients suffering from active tuberculous disease of the lungs are not admitted. While patients of any age and either sex are eligible for treatment, special attention is paid to the needs of children.

The Children's Department.—In this department arrangements are made for education concurrently with treatment according to individual requirements. There has been developed a "School in the Sun" for children suffering from glandular, bone and joint, or peritoneal tuberculosis, for children convalescing from infectious

disease, or delicate, ailing, or debilitated children whose constitution needs to be built up before attending ordinary schools; and a "School for Recumbent Children"—*e.g.*, orthopædic cases, sufferers from various forms of paralysis, cardiac or rheumatic conditions, necessitating partial or complete recumbency, but who would derive benefit by additional interests and companionship, and who would be capable of receiving with advantage manual instruction or class or individual teaching suited to their especial needs. The education of such cases is conducted under strict individual medical supervision, the primary aim being restoration to health of the child, combined with such educational facilities as his or her condition wisely permits. For such cases as are ambulant an open-air "School in the Woods" has been built, with sanitary annexe. In the enclosure in which this school is situated are children's gardens, and full facilities for nature study and physical geography lessons. The success of this department renders it probable that in the near future it will have to be considerably extended, and two additional establishments are being planned—the one, Morland Croft, for boys, the other, Morland Court, for girls. The aim of these will be entirely different from that of the ordinary schools for delicate children. As medical treatment will be here the primary consideration, and education secondary and a supplementary but essential feature, it is designed that children accepted will be fitted to enter ordinary schools on completion of treatment, or, if that is impossible, enabled to proceed to the universities when attaining the requisite age. When these annexes to the clinics are ready for occupation Morland Hall will be reserved entirely for adult patients.

The Grounds.—Though Morland Hall is only five minutes' walk from the station and on the outskirts of the town of Alton, it occupies a completely secluded position. The grounds are very attractive, undulating, varied and richly timbered. There are flower and vegetable and rock gardens and orchards, tennis and croquet lawns, nuttery, extensive meadows, and surrounding the grounds is a timbered grass walk over a mile in length.

The Purpose of the Morland Clinics.

The aim of the clinics is to provide adequate specialized treatment, combined in the case of children with suitable educational facilities, in a well-equipped private hospital, situated amidst congenial and healthy surroundings, and offering the amenities of a well-conducted home. These clinics are founded on experience acquired during eighteen years of service as Medical Superintendent at the Treloar Cripples' Hospitals. While abundant provision exists for the children of the working-class parents suffering from surgical tuberculosis, until the establishment of the Morland Clinics no comparable institutions were available for the

better classes in this country. The Morland Clinics have been established to meet what has been ascertained to be a very real need at as low a cost as is practicable consistent with efficiency. The diet is liberal and varied, the patients are supplied with certified tubercle-free milk. The nursing staff includes fully trained sisters and specially trained nurses for Light Treatment, massage, and plaster work. The collaboration and advice of the individual patient's own physician and surgeon is at all times welcome. For major operations patients may select their own surgeon by private arrangement, if they so desire. Intending patients or parents of patients may be interviewed by appointment and after-care supervised at the Clinics' consulting rooms in London. It will be noted, therefore, that the Morland Clinics represent a serious attempt to provide for the middle and upper classes similar treatment to that hitherto available for the hospital class of patient alone, but adapted to the special social needs of its particular cliéntèle.

A NOTE ON THE ELEVENTH ANNUAL CONFERENCE OF THE NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

By B. T. J. GLOVER,
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The Eleventh Annual Conference of the National Association for the Prevention of Tuberculosis was held in London on July 6 and 7, 1925. For the greater part the papers were devoted to the subject of Tuberculosis in Childhood but, in addition, Professor Mollgaard and Professor Faber of the University of Copenhagen described their experiences of the treatment of tuberculosis by the aid of sanocrysin, a gold compound introduced by the former.

The great importance of infection with the tubercle bacillus in the early years of life was emphasized by all who took part in the discussion. Professor Sir Robert Philip repeated the views with which his name has been so long associated—namely, that the distribution of tuberculous infection throughout a civilized population is practically universal and that in an overwhelming majority of cases tuberculization occurs in infancy and childhood, later manifestations of tuberculosis being but efflorescences of the tuberculous seedling early implanted in more or less favourable soil. He emphasized the great importance of recognizing when a child first becomes infected with tuberculosis, and indicated two courses by which detuberculization can be effected—

namely, by (1) placing the patient under an improved and suitable environment, and (2) antigenic treatment—*i.e.*, by the percutaneous use of tuberculin.

It is usual to regard the sources of tuberculous infection as twofold in the main—namely, infection with a bacillus of the human type for the most part from human open cases, and infection with a bacillus of bovine origin. It is obviously of the greatest importance to determine if possible the relative importance of these two sources of infection if preventive measures are to be rightly chosen. The most complete figures yet published were brought forward by Dr. Stanley Griffith, showing how extremely common was infection by the bovine bacillus in childhood. Table I. shows the percentage of bovine infections found in different varieties of tuberculosis in humans—(*a*) in children under five years of age, and (*b*) at all ages. It also gives the percentage of bovine infections in alimentary and respiratory cases respectively.

TABLE I.—INDICATING PERCENTAGES OF TUBERCULOUS INFECTION.

Variety of Tuberculosis.	Number of Cases.	Percentage of Cases infected with Bovine Tubercle Bacilli.	
		Under 5 Years of Age.	All Ages.
			Per Cent.
Cervical gland	125	85·0 per cent. of 20 cases	48·0
Lupus	140	66·0 ,, ,, 50 ,,	51·0
Scrofuloderma	52	58·3 ,, ,, 12 ,,	38·4
Bone and joint	514	30·2 ,, ,, 96 ,,	19·2
Genito-urinary	21	—	19·0
Meningeal	12	—	16·6
Pulmonary	275	—	1·1
Alimentary	35	—	80·0
Respiratory, double portal (respiratory and alimentary), and uncertain ...	116	—	1·8
Post-mortem cases, children under 12 (L.G.B. series)	113	21·3 ,, ,, 61 ,,	17·6

It will be seen that the highest percentage of bovine infections has been found in children under five years of age, and in those forms of tuberculosis (cervical gland and abdominal tuberculosis) in which the primary lesions were in the glands of the alimentary tract. The age incidence taken in conjunction with the anatomical distribution of the primary lesions clearly points to cow's milk as the source of infection with bovine tubercle bacilli. Dr. Griffith differs from the views of Calmette in regard to the origin of phthisis pulmonalis and concludes that (1) the path of infection of the bovine tubercle bacillus is almost exclusively the alimentary tract; (2) the chief portal of entry of the

human tubercle bacillus is the respiratory tract; and (3) primary abdominal tuberculosis due to the human tubercle bacillus is rare. Figures such as these depend for their usefulness upon the certainty with which the human bacillus can be distinguished from the bovine bacillus, but it is understood that in the hands of Dr. Griffith this differentiation is reasonably certain.

The Conference was so impressed by the importance of tuberculous milk in regard to tuberculous infection of human beings that a resolution was passed to the effect that a considerable proportion of tuberculosis in childhood is due to infection through the presence of tubercle bacilli in milk offered for human food. The Government was urged to render effective the provisions of the Milk and Dairies Acts of 1915 and 1922, and also urged to consider the desirability of including in school education more instruction regarding health conservation and simple methods for the prevention of tuberculosis.

Important though the subject of Tuberculosis in Childhood may be there was little doubt that the Conference was anxious to hear what could be said on the subject of gold treatment. Professor Mollgaard described the conditions which must be fulfilled by a chemotherapeutic agent in order that it shall exercise a bactericidal effect. The toxic effect of a heavy metal on organisms, he said, is due to the positively charged metallic ion. The first step in diminishing the organotropy of any compound of heavy metal is to enclose the metal in a real complex body, of which the stability is sufficient to keep the concentration of metallic ions in watery solutions practically equal to o. The complex in which the metal is enclosed must not itself be poisonous to the organism. Finally, the whole complex must have such chemical qualities that the amount of it which does not enter into combination with the parasite is excreted unaltered or, if decomposed, is excreted without the formation of metallic ions or other bodies poisonous to the organism. In tuberculosis, however, the question is further complicated by two peculiarities in pathology—namely (*a*) the tubercle bacillus being protected by a fatty envelope the drug, in order to possess bactericidal effect, must be capable of penetrating this and reaching the body of the bacillus, and (*b*) tuberculous tissue is poor in blood vessels so that a chemical compound must be capable of diffusing from the blood stream into infected tissue in order to reach the tubercle bacilli. In sanocrysin, the sodium salt of "aurothiosulfuric acid," there exists a therapeutic agent which up to the present best fulfils these properties.

It possesses the following qualities:

(1) It is easily soluble in water; (2) it is real complex; the concentration of gold ions in watery solution is practically o; (3) it is rapidly diffusable through animal tissue; (4) it is slowly decomposed in the organism and a proportion of it remains, therefore, for a long time

(four to eight days generally) in the blood in a soluble form; (5) it is partly decomposed in the organism, evidently yielding metallic gold, and partly excreted principally through the kidneys in a complex form; (6) it does not precipitate the proteins of the serum; (7) it penetrates the lipoid membrane of the tubercle bacilli in a short time carrying gold into their bodies in amounts which can be demonstrated by microchemical reactions; (8) it prevents the growth of tubercle bacilli in cultures.

The clinical use of sanocrysin was described mainly by Professor Faber and Professor Lyle Cummins. Many examples were brought forward to show that its use could result in (*a*) material reduction in the apparent extent of the lesion, (*b*) sterilization of the sputum, and (*c*) an improvement in the patient's general condition indicative of the subjugation of the disease. There is, however, a very severe reaction attending the use of sanocrysin. Both experiments on animals and clinical experience have shown that (1) sanocrysin is able to produce an acute and very severe intoxication in highly tuberculized individuals; (2) this intoxication exhibits all the principal features of tuberculin shock and does not occur in healthy animals, even when large doses are injected, and (3) the intoxication can be prevented, or alternatively cured, by means of a specific serum made by the immunization of sound horses with killed tubercle bacilli. The acute intoxication due to the liberated toxins is good evidence that sanocrysin has a bactericidal influence on the tubercle bacillus.

It is still too early to pronounce on the value of sanocrysin treatment, but it does appear that it is a compound able to bring about in some patients marked and quick improvements such as are not obtainable by any other method of treatment.

SOME PERSONAL IMPRESSIONS ON THE INTERNATIONAL CLIMATOLOGICAL CONGRESS AT DAVOS.

By BERNARD HUDSON,

M.D., M.R.C.P.

Swiss Federal Diploma, Medical Superintendent of the Victoria Sanatorium, Davos.

The importance of the Congress on Climatology which was held at Davos, August 16 to 22, was apparently not generally understood in Great Britain. That is, perhaps, not altogether to be wondered at, since the organizers themselves hardly realized at first what a big thing they had done. When Dr. Vogel-Eysern of Davos suggested to the

Research Institute there, and to the Medical Society of the resort, that such a congress should be attempted, he was thinking on a much more modest scale. A goodly number of the leading climatologists of Europe were approached, in the hope that enough would respond to make a tolerable conference. To the pleased astonishment of the organizers, they nearly all responded, and the committee found that they had a programme of sixty papers in their hands. All sixty were allowed to stand, on the supposition that many would fall out. As a matter of fact, some fifty papers were actually read by that number of the most eminent authorities of most European countries.

Unfortunately, the British representation suffered from the absence of two of the most prominent men who had intended to be present, Sir Henry Gauvain and Sir Frederick Mott, both of whom happened to be in ill-health by the time the Congress came round. Among the English-speaking members of the Congress were Professor Leonard Hill of the National Institute of Medical Research; Professor Graham Lusk, the American physiologist; Dr. King Brown, Medical Officer of Health for the Borough of Bermondsey; Dr. Pickworth, Director of the Research Laboratories of the Joint Board of Research for Mental Diseases at the City University, Birmingham; and Dr. Burrell of London.

The printed proceedings of the Congress will soon be published. There is no need, therefore, for me to report what was said and read at the sittings. But readers of this Journal may be interested in a few facts and personalities, which the proceedings will not contain. Personality counted for a great deal, not only at the Congress, but even in creating it. Nominally, it was organized by the Swiss Research Institute at Davos, and, indeed, the work of organization was done there. But behind the Institute and affiliated with it, is the Davos Meteorological-Physical Observatory of Professor C. Dorno. There is no doubt that a good many climatologists were drawn to Davos by the name and fame of Dorno, whose work during the past twenty years has been attracting more and more the attention of those in all countries who are studying the problems of climate, especially in relation to medicine. In England it is very largely through the publications of Leonard Hill that Dorno has become known. Hill has emphasized more than once that Dorno is doing at Davos valuable work which no meteorologist is doing in Great Britain, but which ought to be done here. This Congress afforded an opportunity for the first meeting of these two men, and I had the privilege of being at the Observatory one afternoon when Dorno showed Leonard Hill and others very thoroughly over his establishment, which is certainly an extraordinarily compact institution crowded with the best and newest instruments for all kinds of meteorological and physical observation and registration. Dorno showed and explained, among other things, the new Davos

"Frigorimeter," devised by Dr. Thilenius and himself, for measuring and recording cooling power, which is claimed to be simpler and very much cheaper than Professor Hill's recording katathermometer.

It is rather curious that although the Congress was organized by the Swiss Institute for Alpine Physiology and Tuberculosis Research (to give it its full name), and although Davos is mainly a resort for the treatment of tuberculosis, tuberculosis figured quite insignificantly in the programme of titles, only two out of the fifty papers being devoted to tuberculosis. This seems worth saying in view of the fact that some of the most important lay journals spoke of the Congress as being on the subject of "climate in relation to tuberculosis." Of course, tuberculosis loomed in many of the papers not specifically devoted to it; but the most noteworthy feature of the Congress was precisely the breadth of its grasp and the extraordinary range of subject and treatment that it brought together under the banner of climate. One professor would talk of climate as an astronomic or cosmic conception, and at the same sitting we were hearing about the climate of a back-yard in the slums of London, or the still more private climate of a bedroom or that inside a suit of clothes; we listened to the latest ideas and statistics about the extraordinary extremes of climate that prevail on the earth, the climate of mountain caves and their plant life, atmospheric opacity as an element of climate, the climate of the mountains, the climate of the seaside, the influence of light and temperature on plants, climate and sleep, adaptation to the climate of the high mountains in old age, climate and metabolism, iodine and environment, climate and pigmentation; to a series of studies on atmospheric radiation and electricity, besides a long and varied list of papers of a clinical nature in relation to climate.

In view of the extraordinary number of eminent men got together for this Congress, it had been remarked that it was a thing that could only be done once; but this Congress itself took steps to prepare for repetitions. An international committee was formed to arrange for the organization of similar congresses at intervals of three years at different centres. This was announced at the concluding social soirée. Professor Leonard Hill, in the course of an interesting little speech on that occasion, welcomed the proposal of future congresses placed at three-year intervals, but was inclined to support the view that the congresses should be held in Switzerland, our playground and health-giving land, and in Davos, "where the work of Dorno is enshrined." "No subject will be more important in future," he said (and this little address will not get into the proceedings), "than biological climatology and its application to preventive medicine and therapeutics. The new Research Institute here under Professor Loewy is of happy augury for better days to come. Davos is a Mecca, with Dorno its prophet, to

which we have made pilgrimage. His amazing and untiring energy has been devoted for years to the placing of meteorology on a basis important to us as biologists and medical men. The ultra-violet rays, the physiologicals aturation deficit, the cooling power, have now come to their own, and the old-fashioned meteorology must admit their study as of first importance."

King Brown is another Englishman who was well to the fore at this Congress. His very human paper on the climate of a big city and the dwellings of the poor caught general attention. He was to be seen in close earnest conversation with O. Bernhard, the veteran Swiss surgeon, whose classic book on heliotherapy and surgery he is engaged on translating into English, and after the Congress, King Brown went on to St. Moritz to see Bernhard's clinic. Dr. Smiles, who was to read a paper on "Physical Considerations in Phototherapy," and Dr. R. A. Young, who also intended to participate, were unfortunately both unable to attend the Congress.

ASSOCIATIONS AND INSTITUTIONS.

THE QUANTOCK SANATORIUM FOR SOMERSETSHIRE.

THE County Council for Somerset now possesses a central institution of its own for tuberculous cases, having acquired the mansion formerly occupied by the late Mr. E. J. Stanley, M.P., together with adjacent land, at a cost of £22,700, and something like £16,000 have been expended in adaptation and equipment. Sir George Newman, Chief Medical Officer of the Ministry of Health, opened the Sanatorium on June 26. Dr. W. G. Savage, the County Medical Officer, has kindly supplied us with the following particulars: The estate is about 500 feet above sea-level, and comprises 2,406 acres. The mansion house was erected by the late Lord Taunton between the years 1857 and 1860. Such an extensive area as over 2,000 acres is not necessary for tuberculosis, but the ownership of it ensures protection of the water supply and enables abundant walks to be planned for the patients. While most of the timber is being cut and removed by the late owner, the County Council has reserved an area of about 220 acres round the sanatorium in which the timber is to be left standing. As the woodland is cleared it is let to the Forestry Commission for replanting. The sanatorium is being developed in several stages. The work so far carried out has been the adaptation of the mansion house, and this now provides accommodation for sixty-one patients (men and women). Later on it is proposed to utilize the estate block for the accommodation of fifty children, mostly in the very early stages of tuberculosis, when permanent cure is reasonably certain. Ample room also exists for any further extensions which time and experience may justify. The wards for the patients are in the main building, and are chosen so as to give abundant sunshine. It is not, in general, desirable to have the administrative section and patients under the same roof, but in the present case this drawback is minimized by the readiness with which it has been possible to adapt the buildings so as to keep the administrative and patients' portions almost entirely separate. The architects are Messrs. Martin, Martin and Ward, of Birmingham. The machinery and laundry block is a new building, and has been planned so as to provide for all developments and extensions likely to be made in the future. It is intended to make a tennis court for the staff and lawns for croquet, putting and clock golf for the patients. It is proposed ultimately to concentrate most of the tuberculosis institutional work in the county on this site, as there is abundant space for future developments. The motto of the Labouchere family which may be noticed on the stained glass windows—*Passibus citis sed æquis* ("By quick but equal steps")—remains a suitable motto for the institution. It is appropriate to the campaign against tuberculosis, and it is hoped that the work carried out at the Quantock Sanatorium will reduce the scourge of tuberculosis in the county to smaller dimensions.

NOTICES OF BOOKS.

HELIOTHERAPY IN PLEURO-PULMONARY TUBERCULOSIS.

THE new work of Drs. Hervé and Roussel on Heliotherapy will be of interest to many readers of this Journal.[1] Although the sun cure is now established as the method *par excellence* of treating surgical tuberculosis, its use in pleural and pulmonary forms of the disease continues to meet with more opposition than support. Drs. Hervé and Roussel are, however, convinced that heliotherapy provides a valuable therapeutic agent in the majority of pulmonary cases They consider the best method to be the general sun-bath applied according to Rollier's method of progressive exposure, beginning with the feet and proceeding gradually to insolation of the legs, thighs, abdomen and thorax. Local application to the chest is condemned as dangerous. The authors consider that about 60 per cent. of all cases of pulmonary tuberculosis are suitable for heliotherapy. The 40 per cent. estimated as unsuitable include cachectic subjects, acute forms of tuberculosis, and all patients passing through temporary exacerbations of the disease. Cases in which the temperature has been brought down to normal by means of an artificial pneumothorax are viewed as particularly favourable for sun treatment. Among other classes in which good results may be expected are those with pleural and pleuro-peritoneal involvement, and in general all types in which the tuberculous infiltration is discrete and the tendency to fibrosis well marked. In laryngeal cases local application of sunlight is advocated as well as general sun-baths. It is only in cases with a tendency to general œdema that the treatment is thought to be definitely contra-indicated. The interest of the book is increased by the inclusion of a number of notes of cases and a few temperature charts and skiagrams. Unfortunately the printing of the latter is not sufficiently good for them to be of much value.

ANDREW MORLAND, M.B., B.S. (LOND.).

MANUALS FOR MEDICAL ADVISERS AND WORKS OF REFERENCE.

Tuberculosis officers and all medical advisers who specialize in the treatment of tuberculous cases should make a point of keeping up to date in all matters relating to medical diagnosis and therapeutics. Many affections present symptoms similar to some of those met with in tuberculosis, and not a few subjects of tuberculosis become afflicted with other forms of disease. We would specially commend to the consideration of medical superintendents of sanatoria, tuberculosis officers, and practitioners generally, the new edition of the "Index of Treatment," edited by Dr. R. Hutchison and Mr. J. Sherren.[2] This

[1] "L'Héliothérapie en Plaine et à la Montagne dans la Tuberculose Pleuro-Pulmonaire." By R. Hervé and P. Roussel. Pp. 40. Paris: Maloine et Fils. 1925. Prix fr. 3.

[2] "An Index of Treatment by Various Writers." Edited by Robert Hutchison, M.D., F.R.C.P., and James Sherren, C.B.E., F.R.C.S. Ninth edition, revised and enlarged. Pp. xviii + 1035, with 108 figures. Bristol: John Wright and Sons, Ltd. 1925. Price £2 2s.

encyclopædic work, which was first issued in 1907, is a monumental reference work which no doctor can afford to be without. The contributors number ninety-six, and the articles are alphabetically arranged. Sir Robert Philip, of Edinburgh, deals with Pulmonary Tuberculosis; Sir Henry Gauvain provides an admirable section on General Treatment of Surgical Tuberculosis, giving special attention to Heliotherapy and Artificial Light Treatment; Mr. W. H. Clayton-Greene describes the Management of Tuberculous Glands; Mr. Warren Low is responsible for the article on Tuberculous Disease of Bone; and Mr. Alexander Miles for that on Tuberculosis of Individual Joints. The whole work has undergone revision, and is now thoroughly up to date. A number of new articles appear. The volume is of impressive size, and furnishes the busy practitioner with a complete and authoritative guide to the practice of medicine. There is an excellent index.

A new edition of vol. ii. of Martindale and Westcott's "Extra Pharmacopœia" has just been published.[1] This indispensable reference work is one which every doctor and pharmacist requires if he is to keep abreast with analytical, experimental, and research work connected with medicine, chemistry, and pharmacy. Since the fifteenth edition, issued in 1912, the "Extra Pharmacopœia" has been issued in two volumes. The present volume is a highly concentrated one, containing sections on Physiological Standardization, Iontophoresis, Radiology, Analytical Memoranda, Bacteriological Notes, British Spas, Milk Analysis, Proprietary Medicines, and much other information of practical value. The index is a wonderful example of scientific precision and effectiveness. A copy of this comprehensive work should be available in every hospital, sanatorium, dispensary, and consulting-room.

Mr. Charles Childe has published a thoughtful work on the educational aspect of the cancer problem.[2] It is a revised version of his book, issued in 1906, on "The Control of a Scourge; or, How Cancer is Curable," and sets forth in non-technical, clear words our present knowledge regarding cancer and the best ways in which this menace to human health and happiness can be met. The chief object of the work is to create a more hopeful atmosphere, and to provide for non-medical readers such information as will enable the public to co-operate with the medical profession in an effective campaign against all influences making for cancer, and also in securing means for its early detection and treatment. The book is dedicated to the public, and is one which merits the study of all thoughtful men and women interested in measures for human betterment. It should be of much service to medical officers of health and others engaged in educational work relating to personal and public health.

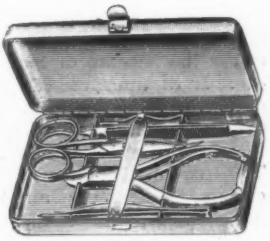
[1] "The Extra Pharmacopœia of Martindale and Westcott." Revised by W. Harrison Martindale, Ph.D., Ph.Ch., F.C.S., and the late W. Wynn Westcott, M.B., D.P.H. Eighteenth edition. Vol. ii. Pp. xlii+728. London: H. K. Lewis and Co., Ltd. 1925. Price 20s.

[2] "Cancer and the Public: The Educational Aspect of the Cancer Problem." By Charles P. Childe, B.A., F.R.C.S., M.R.C.P.E., Chairman of the Health Committee, Borough of Portsmouth, and Consulting Surgeon Royal Portsmouth Hospital. Pp. v+267. London: Methuen and Co., Ltd., 36, Essex Street, W.C. 1925. Price 10s. 6d.

PREPARATIONS AND APPLIANCES.

HYGIENIC APPLIANCES AND THERAPEUTIC PREPARATIONS.

EVERY medical practitioner, nurse, or other person dealing with tuberculous patients in sanatoria, hospitals, or under home conditions, should remember that it is of great importance that every care should be taken in maintaining a hygienic condition of the hands. It is also most desirable that patients should be instructed in regard to the best way to secure perfect cleansing of fingers and nails. This is a matter of great importance, especially when patients are constantly using handkerchiefs, flasks, or placing their hands near or before their mouths when coughing or expectorating. Undoubtedly many young children infect themselves with tubercle bacilli which they have gathered on hands and under nails when crawling or playing in dust-contaminated places. These considerations make it essential that the hands should be subjected to strict hygienic supervision. A particularly valuable aid will be found in the FINGER-NAIL SET which is now available.[1] This consists of a bright metal case, which can be readily carried in the pocket, containing nail and cuticle scissors, splinter forceps, nail file and cleaner, and nail nippers. The various appliances have been skilfully designed and are of first-class workmanship. They are carefully fitted in the case so that they can be carried without displacement or any rattling. Such a practical and serviceable set as this should be in the possession of every doctor, and available for all nurses or other persons responsible for the care of patients and the hygienic management of children.



THE FINGER-NAIL SET.

It is now generally recognized that it is of the first importance that every tuberculous patient should be subjected to a thorough examination of the teeth and gums. If the maximum of benefit is to be attained under sanatorium conditions strict oral hygiene must be maintained. In only too many instances dentures are imperfectly cleaned. There is no excuse for neglect in this matter. The new ADDIS DENTURE BRUSH provides a ready and reliable means for necessary cleansing. It is a specially devised brush with stiff bristles, so grouped that all parts of a denture can be thoroughly brushed. Every patient who wears a denture should be supplied with this serviceable agent.[2]

[1] The Finger-Nail Set is supplied by the Holborn Surgical Instrument Company, Ltd., 26, Thavies Inn, Holborn Circus, E.C. 1. Price 20s.

[2] The Addis Denture Brush is made by Messrs. Addis, Brush Manufacturers, Hertford, Herts. Price 2s. 6d.

THE OUTLOOK.

TUBERCULOSIS IN ENGLAND AND WALES.

MR. NEVILLE CHAMBERLAIN in his recently issued report as Minister of Health[1] contains a section on tuberculosis, in which it is shown that on April 1, 1925, the number of persons receiving treatment in residential institutions at the cost of the local authorities was 846 in excess of the number on the corresponding date in 1924. The number of institutions providing beds for tuberculous cases is 460, and the number of beds available 20,750, 12,883 being provided by local authorities and 7,867 in voluntary institutions. The number of tuberculosis officers working under the scheme of local authorities in England was 354, and the number of approved dispensaries was 457, including 23 out-patient departments of general hospitals approved for special forms of treatment. Special paragraphs are devoted to the consideration of the most important matter of financial arrangements. There are also sections on Tuberculous Ex-Service Men, Village Settlements, After-Care, Tuberculous Workers in Dairies, New Methods of Treatment, Compulsory Notification, and Deaths. The report also contains a concise summary of the work of the Welsh National Memorial Association in its service for tuberculous cases in the Principality of Wales.

Sir George Newman in his last annual report[2] devotes a section to the consideration of tuberculosis, which still continues as one of the formidable problems of national health. A table is given showing that for England and Wales there were, in 1924, 55,040 known cases of pulmonary tuberculosis and 17,684 non-pulmonary cases. The total notifications were 81,973, and the known cases are estimated at 72,724. The actual figures show, as compared with 1923, an increase of over 1,500 fresh notifications of pulmonary tuberculosis, and a very small increase in notifications of non-pulmonary tuberculosis. It is stated that in addition to the figures for new cases formally notified, 8,434 new cases of tuberculosis became known to medical officers of health from sources other than formal notification under the regulations, death returns, etc. The total number of fresh cases of all forms of tuberculosis is estimated at 81,158. There has been an increased mortality from the pulmonary form of the disease. The total number of deaths from all forms of tuberculosis was 41,103. The death-rate from non-pulmonary tuberculosis has fallen, and since 1917 more than one-third of the total mortality. The possible causes for this improvement are suggested: (1) From efforts to lessen the danger from the presence of living tubercle bacilli in cow's milk. (2) The removal from their homes

[1] "Sixth Annual Report of the Ministry of Health, 1924-1925." Pp. xiv+188. London: H.M. Stationery Office. 1925. Price 3s. 6d. net.

[2] "On the State of the Public Health": Annual Report of the Chief Medical Officer of the Ministry of Health for the year 1924. Pp. 266. London: H.M. Stationery Office. 1925. Price 3s. 6d. net.

to sanatoria and hospitals of adults suffering from advanced pulmonary tuberculosis has materially reduced the risk of massive infection of children. (3) The extended facilities for residential treatment of non-pulmonary tuberculosis, and the recognition and treatment of the condition in an earlier stage, have no doubt contributed to the lessened death-rate. Notification is still imperfectly carried out. Sir George Newman does well to deal openly with this matter: "Evidence from various sources suggested that, in a number of urban and rural areas, the medical officers of health were seriously irregular and negligent with regard to the register of notifications of tuberculosis required to be kept by the Tuberculosis Regulations of 1912, and that they had failed to revise their registers periodically as required by Article 4 of the Tuberculosis Regulations of 1921. Apparently the medical officers of health of many smaller urban and rural districts have taken the view that they need not interest themselves particularly in tuberculosis, since the responsibility for carrying out the official scheme of treatment of this disease was vested in the County Council and not in the local sanitary authority. Tuberculosis is a disease of so much importance in connection with the public health problems of an area that it seems particularly unfortunate that any medical officer of health should assume that the special position of the County Council in relation to schemes of treatment in any way detracts from the responsibility of the District Council in regard to this disease. The Tuberculosis Regulations of 1912 specifically indicated the duties and powers of local sanitary authorities in connection with tuberculosis, *and it is essential that these duties and powers should be exercised.* Where County Councils and local sanitary authorities have collateral powers it is indispensable that the work should be carried on in close co-operation, arrangements being made to prevent overlapping. It was found that, in some areas, the tuberculosis *notification register* was either non-existent or had not been revised and kept up to date, so that the medical officer of health was unaware as to the number of notified cases of tuberculosis in his area. It was, consequently, considered necessary to take steps to ensure that due attention should be paid to the question of the proper and periodical revision of the tuberculosis register. The Public Health (Tuberculosis) Regulations, 1924, dated December 18, 1924 (Statutory Rules and Orders, 1924, No. 1411), have therefore been issued." In England tuberculosis work is being carried out in 457 dispensaries by 360 tuberculosis officers. Particulars are given regarding the development of tuberculosis schemes. There is a suggestive section on the Results of Sanatorium Treatment, and the view is expressed that although sanatoria have not achieved all that was expected by some enthusiasts, they have resulted in the cure of a considerable proportion of cases of pulmonary tuberculosis and in the prolongation of life and working capacity in a much larger proportion, and that "at present there is no alternative to sanatorium treatment, which offers a more solid prospect of general all-round gain to the community in the combat against this disease." Special attention should be directed to the paragraphs dealing with the Care and After-Care of Tuberculous Subjects. It is shown that early relapse is chiefly due to the following: (*a*) Life under unsatisfactory home conditions; (*b*) occupation under conditions of too great stress or of unsuitable character; (*c*) absence of strict medical supervision; (*d*) laxity on the part of the patient in matters relating to treat-

ment and hygiene. It is suggested that the principal directions for After-Care should be: (*a*) Advice as to personal and domestic arrangements before entering the sanatorium; (*b*) the home to which the patient has to return may be unsuitable as regards accommodation, bedding, sanitation, etc.; (*c*) the former occupation of the patient may be unsuitable; (*d*) the family being the unit for social welfare work, the activities of an After-Care Committee extend to the children, and various arrangements may become necessary for them. Medical advisers will be interested in the opinions expressed regarding methods and results of treatment.

Sir William Hamer in his last report as Medical Officer of Health to the London County Council[1] gives statistical and other information regarding tuberculosis in London and the means which are being employed in dealing with it. The deaths from tuberculosis of the respiratory system during 1924 numbered 4,486, giving a death-rate of ·98 per thousand. The deaths from other forms of tuberculosis numbered 834, a death-rate of ·18 per thousand of the population. The increase in mortality in 1924 over 1923 is almost entirely confined to ages 20–25 and 45–55. The number of notifications was 11,917, and of these 9,388 were pulmonary and 2,529 other forms of tuberculosis. The number of school children found to be suffering from tuberculosis remains remarkably low, only 139 cases being discovered in the course of school medical inspection. Excellent combined work is being carried out by the school medical service and the tuberculosis dispensaries. There is a valuable section on Open-Air Education, in which reference is made to the work of the four open-air day schools conducted by the L.C.C.

The Ministry of Health have issued recently a number of publications of special interest to medical advisers dealing with tuberculous cases. "The Public Health Act, 1925," demands serious study, especially the provisions for the compulsory removal to hospital of persons suffering from pulmonary tuberculosis. The "Memorandum as to Annual Returns to be furnished by the Chief Administrative Tuberculosis Officers of Local Authorities, and as to the Records kept by Tuberculosis Officers and Medical Officers of Residential Institutions approved by the Minister of Health for the Treatment of Tuberculosis," is an official document which calls for thorough consideration. Circulars have also been issued dealing with "Treatment of Tuberculosis" and "Public Health (Prevention of Tuberculosis) Regulations, 1925," and the "Milk and Dairies (Consolidation) Act, 1915." The Ministry of Agriculture have also issued a new order relating to Bovine Tuberculosis, which should go far to secure the eradication of this disease and contribute to the development of a pure non-tuberculous milk supply.

NOTES AND RECORDS.

The Council of the National Association for the Prevention of Tuberculosis are to be congratulated on the promptitude whereby a handsome 182-page volume of Transactions has been made available

[1] "London County Council: Annual Report of the Council, Vol. III. (No. 2,322), Chapters XXIII. and XXIV. Reports for the Year 1924 of the County Officer of Health and School Medical Officer." London: The County Hall, Westminster, S.E. 1. 1925. Price 2s. 6d.

a month after the holding of the Annual Conference.[1] The volume contains Sir Kingsley Wood's opening address under the general title of Tuberculosis in Childhood. There are communications from Professor Pirquet, Sir Robert Philip, Dr. Stanley Griffith, Dr. R. Wagner, Sir William Thompson, Dr. Clive Rivière, Dr. Fergus Hewat, Dr. Woods Hutchinson, Professor Louise McIlroy, Sir Henry Gauvain, Professor John Fraser, and Dr. Gordon Pugh. As regards the treatment of tuberculosis by sanocrysin, reports are provided by Professor Moolgaard, Professor Faber, Professor Lyle Cummins, and Dr. Nanetti. The volume contains a list of delegates and members.

The Council of the National Association for the Prevention of Tuberculosis have issued their twenty-sixth annual report as a 55-page booklet, giving particulars of the Association's activities, and particulars of the Burrow Hill Colony at Frimley, and synopses of the various cinema films and list of slides relating to tuberculosis now available for educational service.

The Ministry of Health have recently issued a revised list of sanatoria and other residential institutions for tuberculous cases.[2]

The Ministry of Health have issued a guide to their exhibit in the Government Pavilion at this year's British Empire Exhibition, Wembley, in which there is an attractive full-page picture of tuberculous children undergoing sun treatment at Alton in a flower-covered meadow.

The Fellowship of Medicine will hold a series of free lectures on tuberculosis in the lecture room of the Medical Society, 11, Chandos Street, during October, November, and December. The first will be given on October 12 at 5.30 p.m., by Dr. L. S. Burrell, on "Tuberculosis from the Physician's Viewpoint."

A Free Autumn Course of Public Lectures on "Preventable Diseases," on Wednesday afternoons at 4 p.m. at the Royal Institute of Public Health, 37, Russell Square, W.C. 1, will open on October 14, when Professor S. Lyle Cummins, C.M.G., C.B., M.D., will deal with "The Prevention and Arrest of Tuberculosis."

A meeting of the Tuberculosis Society will be held on October 16 at 8 p.m., at 1, Upper Montague Street, Russell Square, W.C. 1, when Dr. F. G. Chandler will read a paper on "Pulmonary Tuberculosis in Children."

A meeting of the Society of Superintendents of Tuberculosis Institutions will be held at 122, Harley Street, on October 19 at 3 p.m., when papers will be read by Dr. J. W. Linnell and Dr. F. R. Walters.

Dr. Jaquerod and Mr. Lauffenburger will hold a course of instruction on pulmonary radiology at Leysin in Switzerland, November 3-7.

[1] "Transactions of the National Association for the Prevention of Tuberculosis," 20, Hanover Square, London, W. 1, at the Eleventh Annual Conference, Robert Barnes Hall (Royal Society of Medicine), 1, Wimpole Street, London, W. 1, July 6 and 7, 1925. Pp. xxiv+182. London: George Putnam and Sons, Ltd., 24-27, Thayer Street, W. 1. 1925.

[2] "List of Sanatoria and other Residential Institutions approved by the Minister of Health for the Treatment of Persons suffering from Tuberculosis and Resident in England and Wales, with the Names of the Administrative Counties and County Boroughs in which the Institutions are situate, and the Date on which the Approval expires in each Case." Pp. 19. London: H.M. Stationery Office. 1925. Price 2d.

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